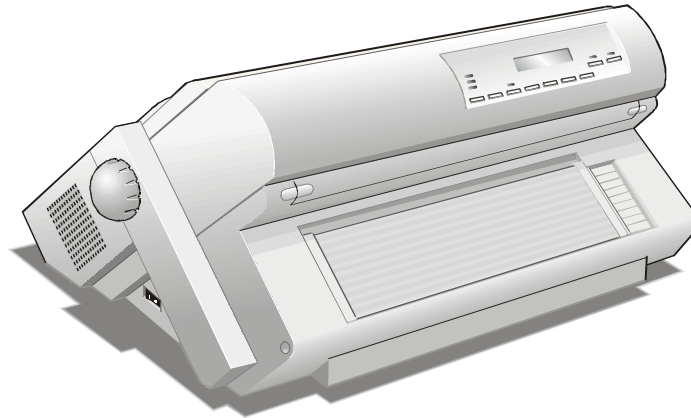


**Model 3850**

# **Programmer's Manual**



**GENICOM<sup>®</sup>**

GEK-01003

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# Commands

This section provides information about the commands supported by the printer . The commands are organized by function groups. Each command has both a brief and a detailed description.

## General Overview

This appendix provides information about the commands supported by the printer .

The commands are organized by function groups.

Each command has both a brief and a detailed description.

Each command has the following structure:

- Name and function description. Information about protocol
- The hexadecimal and decimal codes for the command:  $n$  represents variable parameters of the command. The functions of these parameters are explained in its corresponding command description.

# Command Summary in Alphabetical Order

## EPSON Emulation Commands

|                               |                                                                |    |
|-------------------------------|----------------------------------------------------------------|----|
| ACK                           | Acknowledge.                                                   | 55 |
| BEL                           | Sounds the buzzer.                                             | 50 |
| BS                            | BACK SPACE.                                                    | 41 |
| CAN                           | Cancels data.                                                  | 53 |
| CR                            | Carriage return.                                               | 44 |
| DC1                           | Selects printer or XON.                                        | 54 |
| DC2                           | Cancels the compressed printing.                               | 13 |
| DC3                           | Deselects printer or XOFF.                                     | 57 |
| DC4                           | Cancels double width printing.                                 | 17 |
| DEL                           | Deletes character.                                             | 53 |
| ESC                           | Escape (control sequence introducer).                          | 49 |
| ESC – n                       | Selects or cancels underlined printing.                        | 22 |
| ESC #                         | Cancels MSB control.                                           | 58 |
| ESC \$ n1 n2                  | Absolute dot position.                                         | 43 |
| ESC % n                       | Selects internal/downloaded characters.                        | 31 |
| ESC & NUL n m a0 a1 d1 ....dx | Defines the 24-pin Download Characters.                        | 59 |
| ESC ( t n1 n2 d1 d2 d3        | Assigns a character set to active character set number 0 to 3. | 36 |
| ESC * m n1 n2 p1 p2 ... px    | Selects bit image mode.                                        | 40 |
| ESC / n                       | Selects Vertical Format Unit Channel.                          | 49 |
| ESC ? m n                     | Re-defines graphics mode.                                      | 37 |
| ESC @                         | Resets printer.                                                | 56 |
| ESC [ - n1 n2 m d1 d2         | Selects the score line.                                        | 63 |
| ESC [ @ n1 n2 m1m2 m3 m4      | Selects double-high printing.                                  | 18 |
| ESC [ p1;p2 SP ~              | Selects emulation.                                             | 64 |
| ESC [ T n1 n2 m1 m2 m3 m4     | Selects Code Page or ISO Code tables.                          | 29 |
| ESC [ u n                     | Activates/cancels barcode mode.                                | 26 |
| ESC [ v n m                   | Sets barcode parameters.                                       | 26 |
| ESC \ n1 n2                   | Sets relative dot position.                                    | 45 |
| ESC + n                       | Sets n/360-inch line spacing.                                  | 16 |
| ESC <                         | Immediate carriage return.                                     | 62 |
| ESC =                         | Sets MSB equal to zero (0).                                    | 62 |
| ESC >                         | Sets MSB equal to one (1).                                     | 62 |
| ESC 0                         | Sets 1/8-inch line spacing.                                    | 15 |
| ESC 1                         | Sets vertical spacing to 7/72 inch.                            | 15 |
| ESC 2                         | Sets 1/6-inch (text) line spacing.                             | 14 |
| ESC 3 n                       | Sets graphics line spacing.                                    | 15 |
| ESC 4                         | Selects italics print mode.                                    | 22 |

|                        |                                                 |    |
|------------------------|-------------------------------------------------|----|
| ESC 5                  | Cancels italics print mode.                     | 22 |
| ESC 6                  | Enables expanded character set.                 | 57 |
| ESC 7                  | Enables control code execution.                 | 58 |
| ESC A n                | Sets text line spacing.                         | 14 |
| ESC a n                | Selects text alignment.                         | 25 |
| ESC b c n1 ... nk NUL  | Sets vertical tabs in VFU channels.             | 48 |
| ESC B n1 n2 ... nk NUL | Vertical tabs.                                  | 47 |
| ESC C n                | Sets page length (lines per page).              | 9  |
| ESC C NUL n            | Sets page length (inches per page).             | 10 |
| ESC D n1 n2.... nk NUL | Sets horizontal tab stops.                      | 42 |
| ESC E                  | Selects emphasized printing.                    | 20 |
| ESC EM n               | Selects/deselects Automatic Sheet Feeder (ASF). | 50 |
| ESC F                  | Cancels emphasized printing.                    | 20 |
| ESC g                  | Selects 15 CPI.                                 | 12 |
| ESC G                  | Selects double strike printing.                 | 20 |
| ESC H                  | Cancels double strike printing.                 | 21 |
| ESC J n                | Single variable line feed                       | 47 |
| ESC j n                | Reverse n/180.                                  | 48 |
| ESC k n                | Selects font style.                             | 33 |
| ESC K n1 n2 p1... px   | Single-density graphics ON.                     | 37 |
| ESC l n                | Sets left margin.                               | 43 |
| ESC L n1 n2 p1 ... px  | Double-density graphics ON.                     | 39 |
| ESC M                  | Selects 12 CPI.                                 | 12 |
| ESC N n                | Sets skip perforation.                          | 11 |
| ESC O                  | Disables the skip perforation.                  | 11 |
| ESC P                  | Selects 10 CPI.                                 | 12 |
| ESC p n                | Selects proportional mode.                      | 14 |
| ESC q n                | Selects character style.                        | 34 |
| ESC Q n                | Sets right margin.                              | 45 |
| ESC r n                | Selects a color ribbon band.                    | 24 |
| ESC R n                | Selects international character sets.           | 31 |
| ESC S n                | Selects subscript or superscript printing.      | 21 |
| ESC s n                | Selects full/half speed printing.               | 49 |
| ESC T                  | Cancels subscript or superscript printing.      | 21 |
| ESC t n                | Selects character table.                        | 34 |
| ESC U n                | Unidirectional printing ON/OFF.                 | 56 |
| ESC W n                | Selects or cancels double width printing.       | 18 |
| ESC w n                | Selects double-high mode.                       | 19 |
| ESC x n                | Selects print mode.                             | 35 |
| ESC Y n1 n2 p1 ... px  | Double- density graphics ON.                    | 39 |
| ESC Z n1 n2 p1 ... px  | Quadruple density graphics ON.                  | 39 |
| ESC! N                 | Selects print mode.                             | 23 |
| ESC: NUL n NUL         | Copies resident font to download RAM.           | 61 |

|              |                                |    |
|--------------|--------------------------------|----|
| ETX          | End of transmission.           | 55 |
| FF           | Form Feed.                     | 47 |
| HT           | Horizontal tab.                | 41 |
| LF           | Line Feed.                     | 46 |
| NUL          | NUL                            | 54 |
| SI or ESC SI | Enables compressed printing.   | 13 |
| SO or ESC SO | Selects double width printing. | 17 |
| SP           | Space.                         | 52 |
| VT           | Vertical tab.                  | 46 |

## IBM Emulation Commands

|                                 |                                       |     |
|---------------------------------|---------------------------------------|-----|
| // n //                         | Embedded Sheet Feeder commands.       | 123 |
| ACK                             | Acknowledge.                          | 117 |
| BEL                             | Sounds the buzzer.                    | 112 |
| BS                              | Backspace.                            | 100 |
| CAN                             | Cancels data.                         | 113 |
| CR                              | Carriage return.                      | 103 |
| DC1                             | Selects printer or XON.               | 116 |
| DC2                             | Cancels compressed printing.          | 70  |
| DC3                             | XOFF                                  | 119 |
| DC4                             | Cancels double-width printing.        | 75  |
| ESC                             | Escape (control sequence introducer). | 109 |
| ESC * m n1 n2 p1 p2 ... px      | Selects bit image mode.               | 98  |
| ESC :                           | Selects 12 cpi.                       | 69  |
| ESC [ \ n1 n2 m1 m2 m3 m4       | Sets vertical units.                  | 74  |
| ESC [ l n1 n2 m1 m2 m3 m4 m5    | Selects font.                         | 92  |
| ESC [ K n1 n2 init ID m1 m2     | Printer setup.                        | 113 |
| ESC [ p1;p2 SP ~                | Selects emulation.                    | 121 |
| ESC [ u n                       | Activates/cancels barcode mode.       | 83  |
| ESC [ v n m                     | Sets barcode parameters.              | 83  |
| ESC [ @ n1 n2 m1 m2 m3 m4       | Selects double-high printing.         | 77  |
| ESC [ [ 3 n                     | Sets metric line spacing.             | 122 |
| ESC [ [ x n                     | Selects national character set.       | 123 |
| ESC [ [ y n1 n2                 | Sets IBM Code Page.                   | 123 |
| ESC \ n1 n2                     | Prints from all characters set.       | 87  |
| ESC ^ n                         | Prints from all characters set.       | 88  |
| ESC = n m id sa1 sa h d1 ... dn | Defines downloaded characters/table.  | 86  |
| ESC 0                           | Sets 1/8-inch line spacing.           | 71  |
| ESC 1                           | Sets 7/72-inch line spacing.          | 73  |
| ESC 2                           | Sets ESC A text line spacing.         | 72  |
| ESC 3 n                         | Sets graphics line spacing.           | 73  |
| ESC 4                           | Set top of form.                      | 104 |

|                          |                                               |     |
|--------------------------|-----------------------------------------------|-----|
| ESC 5 n                  | Automatic line feed.                          | 105 |
| ESC 6                    | Selects character set 2.                      | 120 |
| ESC 7                    | Selects character set 1.                      | 120 |
| ESC A n                  | Stores text line spacing.                     | 72  |
| ESC b                    | Selects the Black (top/1st) color band.       | 80  |
| ESC B n1 n2 ... nk NUL   | Vertical tabs.                                | 107 |
| ESC c                    | Selects the Cyan (2nd) color band.            | 81  |
| ESC C n                  | Sets page length (lines per page).            | 67  |
| ESC C NUL n              | Sets page length (inches per page).           | 68  |
| ESC d n1 n2              | Relative move in-line forward.                | 103 |
| ESC D n1 n2.... nk NUL   | Sets horizontal tab stops.                    | 101 |
| ESC E                    | Selects emphasized printing.                  | 78  |
| ESC EM n                 | Auto Sheet Feeder (ASF) & Paper Path Control. | 109 |
| ESC F                    | Cancels emphasized printing.                  | 78  |
| ESC g                    | Selects 15 cpi.                               | 69  |
| ESC G                    | Selects double-strike printing.               | 78  |
| ESC H                    | Cancels double-strike printing.               | 79  |
| ESC I n                  | Font selection (print mode).                  | 91  |
| ESC j                    | Stops printing.                               | 119 |
| ESC J n                  | Single variable line feed.                    | 108 |
| ESC k n                  | Selects LQ font.                              | 90  |
| ESC K n1 n2 p1... px     | Single-density graphics ON.                   | 94  |
| ESC L n1 n2 p1 ... px    | Double-density graphics ON.                   | 97  |
| ESC m                    | Selects the Magenta (3rd) color band.         | 81  |
| ESC N n                  | Sets skip perforation.                        | 68  |
| ESC O                    | Disables the skip perforation.                | 69  |
| ESC P n                  | Selects or cancels proportional mode.         | 71  |
| ESC Q n                  | Deselects printer.                            | 118 |
| ESC R                    | Sets tabs to default setting.                 | 102 |
| ESC S n                  | Selects subscript or superscript printing.    | 79  |
| ESC T                    | Cancels subscript or superscript printing.    | 80  |
| ESC U n                  | Unidirectional print ON/OFF.                  | 118 |
| ESC W n                  | Selects or cancels double-width printing.     | 76  |
| ESC x n                  | Selects print mode.                           | 92  |
| ESC X n1 n2              | Sets horizontal margin.                       | 102 |
| ESC y                    | Selects the Yellow (4th) color band.          | 82  |
| ESC Y n1 n2 p1 ... px    | Double-density graphics ON.                   | 97  |
| ESC Z n1 n2 p1 ... px    | Quadruple-density graphics ON.                | 98  |
| ESC[ T n1 n2 m1 m2 m3 m4 | Selects Code Page or ISO Code tables.         | 88  |
| ESC_ n                   | Continuous overstrikes.                       | 79  |
| ETX                      | End of transmission.                          | 117 |
| FF                       | Form feed.                                    | 105 |
| HT                       | Horizontal tab.                               | 100 |

|     |                                |     |
|-----|--------------------------------|-----|
| LF  | Line feed.                     | 104 |
| NUL | NUL                            | 116 |
| SI  | Enables compressed printing.   | 70  |
| SO  | Selects double-width printing. | 75  |
| SP  | Space character.               | 112 |
| VT  | Vertical tab.                  | 106 |

# ANSI Emulation Commands

|                          |                                                                                      |     |
|--------------------------|--------------------------------------------------------------------------------------|-----|
| ACK                      | Acknowledge.                                                                         | 143 |
| BEL                      | Bell.                                                                                | 145 |
| BS                       | Back space.                                                                          | 132 |
| CR                       | Carriage return.                                                                     | 132 |
| DC1                      | Selects printer (Data Control 1).                                                    | 144 |
| DC3                      | Deselects printer (Data Control 3).                                                  | 144 |
| DEL                      | Delete.                                                                              | 145 |
| ENQ                      | Enquiry.                                                                             | 143 |
| ESC                      | Escape.                                                                              | 145 |
| ESC [ p1 a               | Horizontal position relative (HPR).                                                  | 133 |
| ESC [ p1;...pn h         | Sets mode (SM).                                                                      | 147 |
| ESC [ p1 d               | Vertical position absolute (VPA).                                                    | 137 |
| ESC [ p1 q               | Select graphics mode/density (GENGRM).                                               | 155 |
| ESC [ p1; pn l           | Resets mode (RM).                                                                    | 148 |
| ESC [ p1; pn v           | Sets vertical tab stops at specified positions (Multiple Vertical Tab Set - GENVTS). | 140 |
| ESC [ p1 '               | Horizontal position absolute (HPA).                                                  | 133 |
| ESC [ p1 k               | Vertical position backward (VPB).                                                    | 138 |
| ESC [ p1 x               | Selects national character set (Select National Characters - GENSNCR).               | 125 |
| ESC [ p1; p2 f           | Horizontal and vertical position absolute (HVP).                                     | 138 |
| ESC [ p1; p2 SP~         | Selects emulation (GENEMU).                                                          | 148 |
| ESC [ p1; p2; p3 SP      | Customer setup save/unsave (GENCSX).                                                 | 149 |
| ESC [ p1; pn {           | Unidirectional printing (GENUPD).                                                    | 131 |
| ESC [ p1; pn }           | Sets bar code parameters (GENBC).                                                    | 158 |
| ESC [ p1 e               | Vertical position relative (VPR).                                                    | 137 |
| ESC [ p1 j               | Horizontal position backward (HPB).                                                  | 134 |
| ESC [ p1 t               | Special print mode (Oversize/Expanded/Bar code Mode - GENSPM).                       | 130 |
| ESC [ p1; p2 <SP> G      | Sets the line/character spacing.                                                     | 141 |
| ESC [ p1; p2 s           | Left/right margin set (GENSLR).                                                      | 133 |
| ESC [ p1; p2 SP B        | Graphic size modification (GSM).                                                     | 130 |
| ESC [ p1; p2; p3 r       | Form definition (GENFD).                                                             | 141 |
| ESC [ p1; pn g           | Tab clear (TBC).                                                                     | 139 |
| ESC [ p1; pn p           | Assign source for forms (GENASF).                                                    | 152 |
| ESC [ p1;...pn m         | Select graphics rendition (SGR).                                                     | 127 |
| ESC \ or ST              | String terminator.                                                                   | 146 |
| ESC ] p1; pn <ST>        | User defined character substitution (GENUDS).                                        | 154 |
| ESC ] p1;p2;p3;data <ST> | Operating system command (Load Mode OSC).                                            | 150 |
| ESC c                    | Resets to initial state (RIS).                                                       | 146 |
| ESC D or IND             | Index.                                                                               | 135 |
| ESC E or NEL             | Next line.                                                                           | 136 |
| ESC H or HTS             | Horizontal tab setting.                                                              | 134 |

|               |                                                                                        |     |
|---------------|----------------------------------------------------------------------------------------|-----|
| ESC J or VTS  | Vertical tab setting.                                                                  | 140 |
| ESC k         | Prints test character (GENPTC).                                                        | 147 |
| ESC K or PLD  | Partial line down.                                                                     | 136 |
| ESC L or PLU  | Partial line up.                                                                       | 136 |
| ESC M or RI   | Reverse index.                                                                         | 137 |
| ESC P data    | Enter dot graphics mode (Device Control String).                                       | 156 |
| ESC Q or PU1  | Executes Selftest.                                                                     | 146 |
| ESC[ p1; pn u | Sets horizontal tab stops at specified positions multiple horizontal tab set (GENHTS). | 135 |
| ETX           | End of transmission.                                                                   | 142 |
| FF            | Form feed.                                                                             | 140 |
| HT            | Horizontal tab.                                                                        | 134 |
| LF            | Line feed.                                                                             | 135 |
| NUL           | Ignored.                                                                               | 142 |
| SI            | Shift in.                                                                              | 131 |
| SO            | Shift out.                                                                             | 131 |
| SP            | Space.                                                                                 | 132 |
| VT            | Vertical tab.                                                                          | 139 |

# EPSON Emulation Commands

The following printer commands are supported by this printer according to the Epson LQ 1050 emulation.

## EPSON Command Descriptions

See [BASIC Program Sample](#) and result printed by the printer on.

## Setting Form Length

### ESC C n

**Sets page length (lines per page).**

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC C n             |
| Hexadecimal Value | 1B 43 n             |
| Decimal Value     | 27 67 n             |
| Range             | $1 \leq n \leq 127$ |

Sets the forms length to a size specified by the parameter n in lines. When this command is recognized, the forms length is converted to an absolute value based on the current line spacing. Therefore future changes of line spacing will not effect the forms length. This command will reset the perforation skip value to zero (only if in the *System Menu*, the CLEAR MARGINS function, under OTHER OPTIONS, is selected OPT:CLR MRGN>Y value, please see the *User's Manual* on the CD-Rom) and will set a new Top of Form at the current line position. The first line of a form is line 1. This command has precedence over menu selection of form length.

Indeterminate Conditions: A parameter of zero is another sequence. See [ESC C NUL n](#).

---

## ESC C NUL n

**Sets page length (inches per page).**

|                   |                    |
|-------------------|--------------------|
| ASCII Code        | ESC C NUL n        |
| Hexadecimal Value | 1B 43 00 n         |
| Decimal Value     | 27 67 0 n          |
| Range             | $1 \leq n \leq 22$ |

Sets the forms length to a size specified by the parameter n in inches.

This command will reset the perforation skip value to zero (only if in the *System Menu*, the CLEAR MARGINS function, under OTHER OPTIONS, is selected OPT:CLR MRGN>Y value, please see the *User's Manual* on the CD-Rom) and will set a new Top of Form at the current line position. The first line of a form is line 1. This command has precedence over menu selection of form length.

Indeterminate Conditions: A value of zero will leave the previous value in force. If the page length to be set is smaller than the current line spacing setting then the command is ignored.

---

## ESC N n

### Sets skip perforation.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC N n             |
| Hexadecimal Value | 1B 4E n             |
| Decimal Value     | 27 78 n             |
| Range             | $1 \leq n \leq 255$ |

With continuous forms, this command allows setting a bottom margin region, normally used to avoid printing on the perforation. The parameter is presented in rows (lines) to skip. It will be converted to an absolute distance based on the current line spacing value (see [ESC A n](#)). When form length is changed (by ESC C NUL N o ESC C n) the skip perforation is reset (only if in the *System Menu*, under OTHER OPTIONS, the CLEAR MARGINS function is selected with the OPT:CLR MRGN>Y value, please refer to the *User's Manual* on the CD-Rom).

This command overrides menu selection (if in the *Operational Menu*, the PAGE SETUP function is selected with the PAGE:BOT MARGIN value, please refer to the *User's Manual* on the CD-Rom). Indeterminate Conditions: A value of zero will leave the previous value unaltered. A VT or LF into the skip area will cause the printer to move to the first line of the next form

---

## ESC O

### Disables the skip perforation.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC O |
| Hexadecimal Value | 1B 4F |
| Decimal Value     | 27 79 |

Resets the skip perforation value to zero. It overrides menu selection (if in the *Operational Menu*, the PAGE SETUP function is selected with the PAGE:BOT MARGIN value, please refer to the *User's Manual* on the CD-Rom).

# Setting Character and Line Spacings

---

## ESC P

### Selects 10 CPI.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC P |
| Hexadecimal Value | 1B 50 |
| Decimal Value     | 27 80 |

Selects 10 CPI (pica) printing. If condensed mode is also active, then the pitch will change to 17.1 CPI.

---

## ESC M

### Selects 12 CPI.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC M |
| Hexadecimal Value | 1B 4D |
| Decimal Value     | 27 77 |

Selects 12 CPI (elite) printing. If condensed mode is also active, then the pitch will change to 20 CPI.

---

## ESC g

### Selects 15 CPI.

|                   |        |
|-------------------|--------|
| ASCII Code        | ESC g  |
| Hexadecimal Value | 1B 67  |
| Decimal Value     | 27 103 |

Selects 15 CPI printing.

---

## SI or ESC SI

### **Enables compressed printing.**

|                   |              |
|-------------------|--------------|
| ASCII Code        | SI or ESC SI |
| Hexadecimal Value | 1B 0F        |
| Decimal Value     | 27 15        |

This code will enable the compressed printing mode. Character printing will be changed to 17.16 cpi, 20 cpi, ignored or to condensed proportional spacing provided 10 cpi, 12 cpi, 15 cpi or proportional spacing is the currently selected cpi, respectively. Double wide (by both SO and ESC W) and compressed print will produce the equivalent of  $\frac{1}{2}$  the current compressed density.

---

## DC2

### **Cancels the compressed printing.**

|                   |     |
|-------------------|-----|
| ASCII Code        | DC2 |
| Hexadecimal Value | 12  |
| Decimal Value     | 18  |

Cancels the compressed printing mode. the printing will resume at 10 cpi, 12 cpi or proportional spacing, if the currently selected condensed print mode is 17.16 cpi, 20 cpi or condensed proportional spacing, respectively.

---

## ESC p n

### Selects proportional mode.

|                   |             |
|-------------------|-------------|
| ASCII Code        | ESC p n     |
| Hexadecimal Value | 1B 70 n     |
| Decimal Value     | 27 112 n    |
| Range             | n= 00H, 01H |

If the value of n=01H, then proportional spacing mode or condensed proportional spacing mode is enabled if the current print mode is normal or condensed, respectively. Each character has a proportional space width according to the Epson emulation. If the value of n=00H, then proportional mode is disabled.

---

## ESC A n

### Sets text line spacing.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC A n             |
| Hexadecimal Value | 1B 41 n             |
| Decimal Value     | 27 65 n             |
| Range             | $0 \leq n \leq 128$ |

Sets the spacing between lines to n/60" or n/72" (see in the *System Menu*, under OTHER OPTIONS, the OPT:EPSON OGM>N (n/60)/OPT:EPSON OGM>Y (n/72) values, please refer to the *User's Manual* on the CD-Rom).

---

## ESC 2

### Sets 1/6-inch (text) line spacing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 2 |
| Hexadecimal Value | 1B 32 |
| Decimal Value     | 27 50 |

Sets the spacing between lines to 1/6 inch.

---

## ESC 0

### Sets 1/8-inch line spacing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 0 |
| Hexadecimal Value | 1B 30 |
| Decimal Value     | 27 48 |

Sets the spacing between lines to 1/8 inch (8 LPI).

---

## ESC 1

### Sets vertical spacing to 7/72 inch.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 1 |
| Hexadecimal Value | 1B 31 |
| Decimal Value     | 27 49 |

Sets the spacing between lines to 7/72 inch.

---

## ESC 3 n

### Sets graphics line spacing.

|                   |                               |
|-------------------|-------------------------------|
| ASCII Code        | ESC 3 n                       |
| Hexadecimal Value | 1B 33 n                       |
| Decimal Value     | 27 51 n                       |
| Range             | $0 \leq n \leq 255$ (Decimal) |

Sets the spacing between lines to n/180 inch or n/216.

(see in the *System Menu*, under OTHER OPTIONS, the OPT:EPSON OGM>N (n/180)/OPT:EPSON OGM>Y (n/216) values, please refer to the *User's Manual* on the CD-Rom).

---

## ESC + n

### Sets $n/360$ -inch line spacing.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC + n             |
| Hexadecimal Value | 1B 2B n             |
| Decimal Value     | 27 43 n             |
| Range             | $0 \leq n \leq 255$ |

Sets line spacing in increments of  $n/360$  inch according to the parameter n.

## Setting Print Attributes

---

### DC4

**Cancels double width printing.**

|                   |     |
|-------------------|-----|
| ASCII Code        | DC4 |
| Hexadecimal Value | 14  |
| Decimal Value     | 20  |
| Range             |     |

Cancels double width printing initiated by a SO code and returns to the previously selected print compression.

---

### SO or ESC SO

**Selects double width printing.**

|                   |              |
|-------------------|--------------|
| ASCII Code        | SO or ESC SO |
| Hexadecimal Value | 0E or 1B 0E  |
| Decimal Value     | 14 or 27 14  |

This code will enable double width printing for subsequent characters until a line terminator, a DC4 code or an ESC W sequence is received. Character printing will cause each character to be printed twice its current width by printing a given dot column twice at the current DPI (CPI) in effect. The characters are expanded to take up two character spaces each, but the tab positions are not changed. That means that for the power up default tabs, only four doublewide characters can be printed between tab stops. If twelve CPI print is invoked then double wide is invoked, the character will print at six CPI.

---

## ESC W n

**Selects or cancels double width printing.**

|                   |             |
|-------------------|-------------|
| ASCII Code        | ESC W n     |
| Hexadecimal Value | 1B 57 n     |
| Decimal Value     | 27 87 n     |
| Range             | n = 00H,01H |

This command will enable continuous double width printing for subsequent characters. If n is 01H, character printing will have each character elongated to twice its current width. If n is 00H then double width printing mode is canceled. The double wide by ESC W 1 is equivalent to ESC [.

Indeterminate Conditions: If the double width print mode is already active by use of the SO code, the shift out mode is canceled and the ESC W sequence will have the control.

---

## ESC [ @ n<sub>1</sub> n<sub>2</sub> m<sub>1</sub>m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>

**Selects double-high printing.**

|                   |                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC [ @ n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub>  |
| Hexadecimal Value | 1B 5B 40 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> |
| Decimal Value     | 27 91 64 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> |

This command selects double high, double-wide and double line feed options. The following parameter values are allowed:

|                |          |  |
|----------------|----------|--|
| n <sub>1</sub> | always 4 |  |
| n <sub>2</sub> | always 0 |  |
| m <sub>1</sub> | always 0 |  |
| m <sub>2</sub> | always 0 |  |

|                |                                                                       |               |
|----------------|-----------------------------------------------------------------------|---------------|
| m <sub>3</sub> | character height and line feeds (see the chart in the following page) |               |
| m <sub>4</sub> | Character Width                                                       |               |
|                | 0=                                                                    | current value |
|                | 1=                                                                    | single wide   |
|                | 2=                                                                    | double wide   |

|           |                  |      |        |        |
|-----------|------------------|------|--------|--------|
|           | Character Height |      |        |        |
|           |                  | Unch | Single | Double |
| Line Feed | Unch             | 0    | 1      | 2      |
|           | Single           | 16   | 17     | 18     |
|           | Double           | 32   | 33     | 34     |

## ESC w n

**Selects double-high mode.**

|                   |              |
|-------------------|--------------|
| ASCII Code        | ESC w n      |
| Hexadecimal Value | 1B 77 n      |
| Decimal Value     | 27 119 n     |
| Range             | n = 00H, 01H |

If the value of parameter n= 01H, then characters printed following the command will be printed twice as high as normal.

If the value of parameter n= 00H, then this mode is canceled.

---

## ESC E

### Selects emphasized printing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC E |
| Hexadecimal Value | 1B 45 |
| Decimal Value     | 27 69 |

This command will cause subsequent character printing to be emphasized.

Emphasized printing is defined as printing a dot twice with 1/360 inch horizontal spacing between dots.

---

## ESC F

### Cancel emphasized printing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC F |
| Hexadecimal Value | 1B 46 |
| Decimal Value     | 27 70 |

Cancel the emphasized print mode started by ESC E.

---

## ESC G

### Selects double strike printing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC G |
| Hexadecimal Value | 1B 47 |
| Decimal Value     | 27 71 |

This command will cause subsequent character printing to be double strike.

Double strike is accomplished by making two passes of the same printable data with no displacement between dots of the first and second pass.

---

## ESC H

### **Cancels double strike printing.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC H |
| Hexadecimal Value | 1B 48 |
| Decimal Value     | 27 72 |

Cancels the double strike print mode started by ESC G.

---

## ESC S n

### **Selects subscript or superscript printing.**

|                   |              |
|-------------------|--------------|
| ASCII Code        | ESC S n      |
| Hexadecimal Value | 1B 53 n      |
| Decimal Value     | 27 83 n      |
| Range             | n = 00H, 01H |

Enables the super or subscript-printing mode. If the parameter is 00H (NUL), then superscripting will be done. If the parameter is 01H (SOH), then subscripting will be done. In each of these modes, the characters will be shortened to half height and then positioned in the upper (superscript) or lower (subscript) half of the print line. These modes are mutually exclusive of each other and therefore the last one received is active.

---

## ESC T

### **Cancels subscript or superscript printing.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC T |
| Hexadecimal Value | 1B 54 |
| Decimal Value     | 27 84 |

Cancels the super or subscript-printing mode. Characters return to their prior size at the previous baseline position.

---

---

## ESC 4

### Selects italics print mode.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 4 |
| Hexadecimal Value | 1B 34 |
| Decimal Value     | 27 52 |

Enables printing of text characters in italics mode.

---

## ESC 5

### Cancel italics print mode.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 5 |
| Hexadecimal Value | 1B 35 |
| Decimal Value     | 27 53 |

Cancels italic printing enabled by the ESC 4 command.

---

## ESC – n

### Selects or cancels underlined printing.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC – n             |
| Hexadecimal Value | 1B 2D n             |
| Decimal Value     | 27 45 n             |
| Range             | $0 \leq n \leq 255$ |

If the parameter *n* is an odd 8-bit value (such as 01 Hex), then underlining will be enabled. Underlining will be done to all printable characters and spaces subsequent to the command to the last printable character on the line or the command to terminate underlining. If the parameter *n* is an even 8-bit value (such as 00 Hex) then underlining will be disabled.

---

## ESC! N

### Selects print mode.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC! N              |
| Hexadecimal Value | 1B 21 n             |
| Decimal Value     | 27 33 n             |
| Range             | $0 \leq n \leq 255$ |

This command is used to select any valid combination of the printing attributes.

See the following table:

| <b>n</b> | <b>PRINT ENHANCEMENT</b> |
|----------|--------------------------|
| 0        | 10 CPI                   |
| 1        | 12 CPI                   |
| 2        | Proportional             |
| 4        | Condensed                |
| 8        | Emphasized               |
| 16       | Double strike            |
| 32       | Double width             |
| 64       | Italic                   |
| 128      | Underline                |

---

## ESC r n

### Selects a color ribbon band.

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC r n  |
| Hexadecimal Value | 1B 72 n  |
| Decimal Value     | 27 144 n |

Selects the color ribbon band n for printing according to the following table. This requires that the order of colors in the color ribbons be predetermined. Therefore, the color order of the ribbons is as follows:

| PROCESS RIBBON |   |         |
|----------------|---|---------|
| Top            | 1 | Black   |
|                | 2 | Cyan    |
|                | 3 | Magenta |
| Bottom         | 4 | Yellow  |

The ribbon band number or combinations of band numbers to be printed is determined by the parameter n as follows:

| n | BAND # | PROCESS COLOR |
|---|--------|---------------|
| 0 | 1      | Black         |
| 1 | 3      | Magenta       |
| 2 | 2      | Cyan          |
| 3 | 2&3    | Violet        |
| 4 | 4      | Yellow        |
| 5 | 4&3    | Orange        |
| 6 | 4&2    | Green         |

---

## ESC a n

### Selects text alignment.

|                   |         |
|-------------------|---------|
| ASCII Code        | ESC a n |
| Hexadecimal Value | 1B 61 n |
| Decimal Value     | 27 97 n |

Causes text justification according to parameter n as follows:

| <b>n</b> | <b>JUSTIFICATION</b>                                |
|----------|-----------------------------------------------------|
| 0        | Left flush (align text with left margin) (default)  |
| 1        | Centering (center text)                             |
| 2        | Right flush (align text with right margin)          |
| 3        | Full justify (align text with left & right margins) |

## Bar Codes Selection

---

### ESC [ u n

**Activates/cancels barcode mode.**

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC [ u n           |
| Hexadecimal Value | 1B 5B 75 n          |
| Decimal Value     | 27 91 117 n         |
| Range             | $0 \leq n \leq 255$ |

If n = odd value, activates Barcode mode.

If n = even value, cancels Barcode mode.

---

### ESC [ v n m

**Sets barcode parameters.**

|                   |               |
|-------------------|---------------|
| ASCII Code        | ESC [ v n m   |
| Hexadecimal Value | 1B 5B 76 n m  |
| Decimal Value     | 27 91 118 n m |

Sets barcode parameters according to the table in the following page.

Parameter values that are not supported result in the command being ignored.

| <b>n</b> | <b>(Parameter Description)</b> | <b>m (Parameter Limits)</b>                | <b>Value</b> |
|----------|--------------------------------|--------------------------------------------|--------------|
| 0        | Barcode style                  | <i>See the table in the following page</i> | 4            |
| 1        | Barcode height                 | 1 -120 (1/12" increments)                  | 12           |
| 2        | Human Readable line            | 0=disable; 1=enable                        | 1            |
| 3        | Narrow bar width               | 2-255                                      | 3            |
| 4        | Wide bar width                 | 2-255                                      | 7            |
| 5        | Narrow space width             | 2-255                                      | 3            |
| 6        | Wide space width               | 2-255                                      | 7            |
| 7        | Intercharacter space width     | 2-255                                      | 3            |
| 8        | Rotation                       | 0-4                                        | 0            |
| 9        | Horizontal print density       | 1=120;2=144;3=180                          | 1            |
| 10       | Check digit                    | 0-1                                        | 0            |
| 11       | Human Readable font            | 0-4                                        |              |
| 12       | Barcode height                 | 0-240 (1/24 "increment)                    | 0            |

## Barcode Styles Supported:

| <b>m</b> | <b>STYLE</b>                       |
|----------|------------------------------------|
| 0        | Interleaved 2 of 5                 |
| 1        | Bi-directional 2 of 5              |
| 2        | Matrix 2 of 5                      |
| 3        | Industrial 2 of 5                  |
| 4        | Code 3 of 9 (default)              |
| 5        | EAN-8                              |
| 6        | EAN-13                             |
| 7        | Code 11                            |
| 9        | Codabar (default start/stop = a/t) |
| 10       | Codabar (default start/stop = b/n) |
| 11       | Codabar (default start/stop = c/*) |
| 12       | Codabar (default start/stop = d/e) |
| 13       | UPC-A                              |
| 14       | UPC-E                              |
| 15       | Code 93                            |
| 16       | Code 128 (subsets A/B/C)           |
| 17       | Code 128                           |
| 18       | Code 128                           |
| 19       | MSI                                |
| 20       | UPC 2 Supplemental                 |
| 21       | UPC 5 Supplemental                 |
| 22       | EAN 2 Supplemental                 |
| 23       | EAN 5 Supplemental                 |
| 50       | Postnet                            |

This barcode implementation differs from the ANSI implementation in two ways:

1. The parameter values above are binary values (ASCII in ANSI mode).
2. The "Set Parameters command" permits to change of only one parameter at a time.

# Character Set Selection

## ESC [ T n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>

**Selects Code Page or ISO Code tables.**

|                   |                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC [ T n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub>  |
| Hexadecimal Value | 1B 5B 54 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> |
| Decimal Value     | 27 91 84 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> |
| Range             | 0 ≤ n ≤ 255                                                                                        |

Selects code page and/or ISO code table. See the following table:

| n <sub>2</sub>                | Number of parameter bytes that follow (n <sub>1</sub> +(n <sub>2</sub> *256))   |                                                      |
|-------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------|
| m <sub>1</sub>                | m <sub>2</sub>                                                                  | must be 00H                                          |
| m <sub>3</sub> m <sub>4</sub> | Code page number = (m <sub>3</sub> *(m <sub>4</sub> *256)) except for ISO table |                                                      |
| 00 00                         | No change from current setting                                                  |                                                      |
| 01 B5                         | Code page 437                                                                   | MSCP 437                                             |
| 03 52                         | Code page 850                                                                   | MSCP 850                                             |
| 03 53                         | Code page 851                                                                   | EPCP 851                                             |
| 03 54                         | Code page 852                                                                   | MSCP 852                                             |
| 03 55                         | Code page 853                                                                   | EPCP 853                                             |
| 03 57                         | Code page 855                                                                   | MSCP 855                                             |
| 03 5A                         | Code page 858                                                                   | Euro PC Multilingual ( <i>Euro symbol included</i> ) |
| 03 5C                         | Code page 860                                                                   | MSCP 860                                             |
| 03 5F                         | Code page 863                                                                   | MSCP 863                                             |
| 03 60                         | Code page 864                                                                   | EPCP 864                                             |
| 03 61                         | Code page 865                                                                   | MSCP 865                                             |
| 03 62                         | Code page 866                                                                   | MSCP 866                                             |
| 03 63                         | Code page 867                                                                   | EPCP 867                                             |
| 21 80                         | Mazowia (Polish)                                                                |                                                      |

| $m_3$ $m_4$                                        | Code page number = ( $m_3*(m_4*256)$ ) except for ISO table |
|----------------------------------------------------|-------------------------------------------------------------|
| 21 81                                              | Turkish                                                     |
| 21 82                                              | Greek                                                       |
| 21 83                                              | Kamenicky                                                   |
| 21 84                                              | CWI                                                         |
| 21 85                                              | Roman-8                                                     |
| 21 86                                              | IN2                                                         |
| 21 87                                              | Code page 864E                                              |
| 21 8F                                              | ISO 8859-1 WESTERN EUROPE                                   |
| 21 90                                              | ISO 8859-2 EASTERN EUROPE                                   |
| 21 91                                              | ISO 8859-3 SOUTHERN EUROPE                                  |
| 21 92                                              | ISO 8859-4 NORTHERN EUROPE                                  |
| 21 93                                              | ISO 8859-5 CYRILLIC                                         |
| 21 94                                              | ISO 8859-6 ARABIC                                           |
| 21 95                                              | ISO 8859-7 GREEK                                            |
| 21 96                                              | ISO 8859-8 HEBREW                                           |
| 21 97                                              | ISO 8859-9 WESTERN EUROPE 2                                 |
| 17 1B                                              | ISO 8859-15 WESTERN EUROPE ( <i>Euro symbol included</i> )  |
| MSCP = MICROSOFT CODE PAGE; EPCP = EPSON CODE PAGE |                                                             |

See pages [Tables](#) for Code Page and ISO Code Pages.

---

## ESC % n

**Selects internal/downloaded characters.**

|                   |              |
|-------------------|--------------|
| ASCII Code        | ESC % n      |
| Hexadecimal Value | 1B 25 n      |
| Decimal Value     | 27 37 n      |
| Range             | n = 00H, 01H |

If the parameter n=00H, then the resident (internal) characters are selected for printing.  
If n=01H, then the downloaded characters are selected for printing.

---

## ESC R n

**Selects international character sets.**

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC R n             |
| Hexadecimal Value | 1B 52 n             |
| Decimal Value     | 27 82 n             |
| Range             | $0 \leq n \leq 255$ |

Selects the international character set according to the parameter n .

See the table in the following page:

| <b>n</b> | <b>CHARACTER SET</b> |
|----------|----------------------|
| 0        | US ASCII             |
| 1        | France               |
| 2        | Germany              |
| 3        | United Kingdom       |
| 4        | Denmark I            |
| 5        | Sweden               |
| 6        | Italy                |
| 7        | Spain I              |
| 8        | Japan                |
| 9        | Norway               |
| 10       | Denmark II           |
| 11       | Spain II             |
| 12       | Latin America        |
| 13       | Korea                |
| 64       | Legal                |
| 70       | Netherlands          |
| 71       | Anglo-Universal      |
| 72       | Spanish America      |
| 73       | Portugal             |
| 74       | Africa               |
| 75       | Switzerland          |
| 76       | Turkey               |
| 77       | Greece               |
| 78       | Yugoslavia           |
| 79       | Cyrillic             |

See [Epson National Variations](#) table.

---

## ESC k n

### Selects font style.

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC k n  |
| Hexadecimal Value | 1B 6B n  |
| Decimal Value     | 27 107 n |

This command selects either the resident font or font card fonts based on the value of n. This command will also accommodate fonts in the Optional CG chip.

| <b>n</b> | <b>FONTS</b>          |
|----------|-----------------------|
| 0        | Roman (font card)     |
| 1        | Gothic                |
| 2        | Courier               |
| 3        | Prestige              |
| 4        | Script                |
| 5        | OCR-B                 |
| 6        | OCR-A                 |
| 7        | Orator                |
| 8        | Presentor (font card) |
| 9        | Script C (font card)  |
| 10       | Option font 1         |
| 11       | Option font 2         |
| 12       | Option font 3         |
| 13       | Option font 4         |

---

## ESC q n

### Selects character style.

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC q n  |
| Hexadecimal Value | 1B 71 n  |
| Decimal Value     | 27 113 n |

This command selects character style and is valid for normal text only, that is, is not valid for graphic characters.

| n | CHARACTER STYLE     |
|---|---------------------|
| 0 | Normal              |
| 1 | Outline             |
| 2 | Shadow              |
| 3 | Outline with Shadow |

---

## ESC t n

### Selects character table.

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC t n  |
| Hexadecimal Value | 1B 74 n  |
| Decimal Value     | 27 116 n |

Causes the characters printed for received data from 80H to FFH to be printed from one of the three character sets according to the parameter *n*. See the following table page:

| n | CHARACTER SET                                                                                                                    |
|---|----------------------------------------------------------------------------------------------------------------------------------|
| 0 | Epson Set (Italics).                                                                                                             |
| 1 | IBM Set (Character Graphics) dependent upon ESC 6 or ESC 7.<br>If ESC 6 or ESC 7 not previously received then defaults to Set 1. |
| 2 | Remaps DLL Character Set from position 0 -127 to 128-255.                                                                        |

---

## ESC x n

**Selects print mode.**

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC x n  |
| Hexadecimal Value | 1B 78 n  |
| Decimal Value     | 27 120 n |

This command selects various print modes. See the table below:

| <b>n</b> | <b>PRINT MODE</b> |
|----------|-------------------|
| 0        | Draft             |
| 1        | Letter Quality    |

## ESC ( t n<sub>1</sub> n<sub>2</sub> d<sub>1</sub> d<sub>2</sub> d<sub>3</sub>

**Assigns a character set to active character set number 0 to 3.**

|                   |                                                                                      |
|-------------------|--------------------------------------------------------------------------------------|
| ASCII Code        | ESC ( t n <sub>1</sub> n <sub>2</sub> d <sub>1</sub> d <sub>2</sub> d <sub>3</sub>   |
| Hexadecimal Value | 1B 28 74 n <sub>1</sub> n <sub>2</sub> d <sub>1</sub> d <sub>2</sub> d <sub>3</sub>  |
| Decimal Value     | 27 40 116 n <sub>1</sub> n <sub>2</sub> d <sub>1</sub> d <sub>2</sub> d <sub>3</sub> |
| Range             | n <sub>1</sub> = 3<br>n <sub>2</sub> = 0<br>d <sub>1</sub> = 1                       |

| d <sub>2</sub> | d <sub>3</sub> | CHARACTER SET                        |
|----------------|----------------|--------------------------------------|
| 0              | 0              | Italic (0-127)                       |
| 1              | 0              | Code Page 437 (USA)                  |
| 3              | 0              | Code Page 850 (Multilingual)         |
| 4              | 0              | Code Page 851 (Greek)                |
| 5              | 0              | Code Page 853 (Turkish)              |
| 6              | 0              | Code Page 855 (Cyrillic)             |
| 44             | 0              | Code Page 858 (Euro PC Multilingual) |
| 7              | 0              | Code Page 860 (Portuguese)           |
| 8              | 0              | Code Page 863 (Canada-French)        |
| 9              | 0              | Code Page 865 (Norway)               |
| 10             | 0              | Code Page 852 (East European)        |
| 11             | 0              | Code Page 857 (Turkish)              |
| 13             | 0              | Code Page 864 (Arabic)               |
| 14             | 0              | Code Page 866 (Russian)              |
| 1              | 16             | Greek                                |
| 29             | 15             | ISO 8859-15                          |

# Dot Graphics

## ESC ? m n

**Re-defines graphics mode.**

|                   |           |
|-------------------|-----------|
| ASCII Code        | ESC ? m n |
| Hexadecimal Value | 1B 3F m n |
| Decimal Value     | 27 63 m n |

Re-defines the graphics mode 'n' (K, L, Y, Z) to the graphics mode 'm' found in the ESC \* m command. The limits of parameter 'm' are the same as the limits of parameter 'm' in the ESC \* m command. Subsequent activation of the re-defined graphics mode (ESC K, L, Y, Z) requires that the correct number of data bytes per the ESC \* m are received.

## ESC K n<sub>1</sub> n<sub>2</sub> p<sub>1</sub>... p<sub>x</sub>

**Single-density graphics ON.**

|                   |                                                                       |
|-------------------|-----------------------------------------------------------------------|
| ASCII Code        | ESC K n <sub>1</sub> n <sub>2</sub> p <sub>1</sub> ... p <sub>x</sub> |
| Hexadecimal Value | 1B 4B n <sub>1</sub> n <sub>2</sub> p <sub>1</sub> ... p <sub>x</sub> |
| Decimal Value     | 27 75 n <sub>1</sub> n <sub>2</sub> p <sub>1</sub> ... p <sub>x</sub> |
| Range             | n <sub>1</sub> : 0-255; n <sub>2</sub> : 0-3                          |

| BIT | VALUE |                                                                                                                                                                                                            |
|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7   | 128   | Add up the numbers corresponding to the dots that you want in each column.<br>For example: if you want a dot in the 7 <sup>th</sup> , 4 <sup>th</sup> and 1 <sup>st</sup> pins the count is 146 = 128+16+2 |
| 6   | 64    |                                                                                                                                                                                                            |
| 5   | 32    |                                                                                                                                                                                                            |
| 4   | 16    |                                                                                                                                                                                                            |
| 3   | 8     |                                                                                                                                                                                                            |
| 2   | 4     |                                                                                                                                                                                                            |
| 1   | 2     |                                                                                                                                                                                                            |
| 0   | 1     |                                                                                                                                                                                                            |

These numbers replace the parameter  $p_1$  to  $p_x$  in the escape sequence, where  $p_1$  is the  $n^\circ$  corresponding to the 1<sup>st</sup> graphics pattern column and  $p_x$  refers to the last column.

8 dot is expanded to 24 dot data:

| 8 bits in 1 byte |                |          |
|------------------|----------------|----------|
| Byte             | Print Head Pin | Data Bit |
| 1                | 1              | 7        |
|                  | 2              | 7        |
|                  | 3              |          |
|                  | 4              | 6        |
|                  | 5              | 6        |
|                  | 6              |          |
|                  | 7              | 5        |
|                  | 8              | 5        |
|                  | 9              |          |
|                  | 10             | 4        |
|                  | 11             | 4        |
|                  | 12             |          |
|                  | 13             | 3        |
|                  | 14             | 3        |
|                  | 15             |          |
|                  | 16             | 2        |
|                  | 17             | 2        |
|                  | 18             |          |
|                  | 19             | 1        |
|                  | 20             | 1        |
|                  | 21             |          |
|                  | 22             | 0        |
|                  | 23             | 0        |
|                  | 24             |          |

---

## ESC L $n_1$ $n_2$ $p_1$ ... $p_x$

### Double-density graphics ON.

|                   |                                   |
|-------------------|-----------------------------------|
| ASCII Code        | ESC L $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Hexadecimal Value | 1B 4C $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Decimal Value     | 27 76 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Range             | $n_1$ : 0-255, $n_2$ : 0-6        |

This code is a terminator code and therefore causes the current contents of the print buffer to be printed out, then sets double density, half speed graphics printing, which allows the printing of 120 horizontal dots per inch. For more detailed information, see the description of the [ESC K](#) command.

---

## ESC Y $n_1$ $n_2$ $p_1$ ... $p_x$

### Double- density graphics ON.

|                   |                                   |
|-------------------|-----------------------------------|
| ASCII Code        | ESC Y $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Hexadecimal Value | 1B 59 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Decimal Value     | 27 42 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Range             | $n_1$ : 0-255, $n_2$ : 0-6        |

This code is a terminator code and therefore causes the current contents of the print buffer to be printed out, then sets double density, normal speed graphics printing which allows the printing of 120 horizontal dots per inch. For more detailed information, see the description of the [ESC K](#) command.

---

## ESC Z $n_1$ $n_2$ $p_1$ ... $p_x$

### Quadruple density graphics ON.

|                   |                                   |
|-------------------|-----------------------------------|
| ASCII Code        | ESC Z $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Hexadecimal Value | 1B 90 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Decimal Value     | 27 90 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Range             | $n_1$ : 0-255, $n_2$ : 0-12       |

This code is a terminator code and therefore causes the current contents of the print buffer to be printed out, then sets quadruple density, half speed graphics printing which allows the printing of 240 horizontal dots per inch. For more detailed information, see the description of the [ESC K](#) command.

## ESC \* m n<sub>1</sub> n<sub>2</sub> p<sub>1</sub> p<sub>2</sub> ... p<sub>x</sub>

### Selects bit image mode.

|                   |                                                                                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC * m n <sub>1</sub> n <sub>2</sub> p <sub>1</sub> p <sub>2</sub> ... p <sub>x</sub>                              |
| Hexadecimal Value | 1B 2A m n <sub>1</sub> n <sub>2</sub> p <sub>1</sub> p <sub>2</sub> ... p <sub>x</sub>                              |
| Decimal Value     | 27 42 m n <sub>1</sub> n <sub>2</sub> p <sub>1</sub> p <sub>2</sub> ... p <sub>x</sub>                              |
| Range             | m = 0,1,2,3,4,6,7,8,32,33,34,35,36, 38,39,40<br>0 < n <sub>1</sub> , n <sub>2</sub> < 255; 0 < p <sub>x</sub> < 255 |

Select 8-wire or 24-wire bit image mode according to the table below.

The parameter m determines the horizontal density as well as the number of wires to be fired. For 8-wire images, the total number of data bytes (p<sub>x</sub>) to be sent is determined by the following formula: n<sub>1</sub>+(n<sub>2</sub>x256). For 24-wire images by the following formula: 3x(n<sub>1</sub>+(n<sub>2</sub>x256)).

| m  | DPI | # WIRES | DENSITY NAME        |
|----|-----|---------|---------------------|
| 0  | 60  | 8       | Single-density      |
| 1  | 120 | 8       | Double-density      |
| 2  | 120 | 8       | Double (high-speed) |
| 3  | 240 | 8       | Quadruple-density   |
| 4  | 80  | 8       | CRT Graphic I       |
| 6  | 90  | 8       | CRT Graphic II      |
| 7  | 180 | 8       | Triple-density      |
| 8  | 360 | 8       | Hex-density         |
| 32 | 60  | 24      | Single-density      |
| 33 | 120 | 24      | Double              |
| 34 | 120 | 24      | Double (high-speed) |
| 35 | 240 | 24      | Quadruple-density   |
| 36 | 80  | 24      | CRT Graphic I       |
| 38 | 90  | 24      | CRT Graphic II      |
| 39 | 180 | 24      | Triple-density      |
| 40 | 360 | 24      | Hex-density         |

## Horizontal Movements

---

### BS

#### **BACK SPACE.**

|                   |    |
|-------------------|----|
| ASCII Code        | BS |
| Hexadecimal Value | 08 |
| Decimal Value     | 8  |

The back space command will move the print head one character width to the left based on the current CPI in effect. This means that a horizontal tab followed by a backspace will move the carriage only one character space and will not have the effect of canceling the horizontal tab.

---

### HT

#### **Horizontal tab.**

|                   |    |
|-------------------|----|
| ASCII Code        | HT |
| Hexadecimal Value | 09 |
| Decimal Value     | 9  |

This code will position the print head right to the next horizontal tab stop position. Power up default is to have a tab in the ninth character position and every eighth position thereafter, unless tabs are previously set by host and stored in NVRAM.

Up to 32 horizontal tabs may be set by the ESC D command.

---

## ESC D $n_1 n_2 \dots n_k$ NUL

### Sets horizontal tab stops.

|                   |                               |
|-------------------|-------------------------------|
| ASCII Code        | ESC D $n_1 n_2 \dots n_k$ NUL |
| Hexadecimal Value | 1B 44 $n_1 n_2 \dots n_k$ NUL |
| Decimal Value     | 27 68 $n_1 n_2 \dots n_k$ NUL |

Sets horizontal tab stops in columns as indicated by parameters:

- Parameters are column numbers of which tab stops are to be set.
- There can be a maximum of 32 tab stops at any given time.
- The parameters must come in ascending order.
- Any parameter that found in descending order would be ignored.
- The list of tab stops must be terminated by the NUL code.

Any column that is not referenced in the list is cleared by this command. Therefore using this sequence without any parameters will clear all horizontal tab stops.

The default tab setting from power up is a tab set in column nine and every eight columns thereafter, unless tabs previously set by host and stored in NVRAM. ESC d NUL will clear all horizontal tab settings.

If more than 32 tabs are sent to be set, the 32nd tab setting automatically causes an exit from the tabs set mode and subsequent data is interpreted as normal text data.

Transition from one character pitch to another (e.g. 10 to 12 cpi) will not affect physical position of tabs.

---

# ESC I n

## Sets left margin.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC I n             |
| Hexadecimal Value | 1B 6C n             |
| Decimal Value     | 27 108 n            |
| Range             | $0 \leq n \leq 255$ |

Sets the left margin at the print column specified by parameter n that is in columns at the current pitch. The column value is converted to inches; therefore, subsequent changes of pitch will leave the column width unchanged. The limits of the left margin setting are as follows, where LM = left margin:

| PITCH | LIMITS   |
|-------|----------|
| 10    | LM > 134 |
| 12    | LM > 160 |
| 15    | LM > 201 |
| 17    | LM > 229 |
| 20    | LM > 255 |

---

# ESC \$ n<sub>1</sub> n<sub>2</sub>

## Absolute dot position.

|                   |                                      |
|-------------------|--------------------------------------|
| ASCII Code        | ESC \$ n <sub>1</sub> n <sub>2</sub> |
| Hexadecimal Value | 1B 24 n <sub>1</sub> n <sub>2</sub>  |
| Decimal Value     | 27 36 n <sub>1</sub> n <sub>2</sub>  |
| Range             | $0 \leq n_1, n_2 \leq 255$           |

Causes printing to be continued at the horizontal dot position  $(n_1 + (n_2 * 256)) / 60$  inch from the left margin. Indeterminate Conditions: It is active for one line only. Multiple commands may be executed on the same line. However, if the text printed after the command causes an auto-wrap condition, then subsequent ESC \$ command will be executed on the next line. Since the position is absolute, if the left margin changes, then any new ESC \$ commands would be relative to the new left margin. If the position exceeds the physical right margin, then the command is ignored.

---

## CR

### Carriage return.

|                   |    |
|-------------------|----|
| ASCII Code        | CR |
| Hexadecimal Value | OD |
| Decimal Value     | 13 |

The carriage return will position the print head to the left margin for subsequent printable data to be printed.

This code is a line terminator. A LF is executed based upon the AUTO LF selection (see in the *System Menu*, under OTHER OPTIONS, the AUTO LF function selected with the OPT:AUTO LF>Y value, please refer to the *User's Manual* on the CD-Rom).

If the parallel interface signal AFXT, pin 14, selected in the *System Menu* (see in the *System Menu*, under PARALLEL OPTIONS, the PAR:AFXT function selected with the PAR:AFXT>Y value, please refer to the *User's Manual* on the CD-Rom) is found to be at a logic 0 condition when a CR is received, then a line feed will occur.

---

## ESC Q n

### Sets right margin.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC Q n             |
| Hexadecimal Value | 1B 51 n             |
| Decimal Value     | 27 81 n             |
| Range             | $1 \leq n \leq 255$ |

Sets the right margin at the print column specified by parameter n. Parameter n is in columns at the current pitch. The column value is converted to inches; therefore, subsequent changes of pitch will leave the column width unchanged. The limits of the right margin setting are as follows, where LM = left margin, RM = right margin:

| PITCH | LIMITS              |
|-------|---------------------|
| 10    | $LM + 2 > RM > 136$ |
| 12    | $LM + 3 > RM > 163$ |
| 15    | $LM + 3 > RM > 204$ |
| 17    | $LM + 4 > RM > 233$ |
| 20    | $LM + 4 > RM > 255$ |

---

## ESC \ n<sub>1</sub> n<sub>2</sub>

### Sets relative dot position.

|                   |                                     |
|-------------------|-------------------------------------|
| ASCII Code        | ESC \ n <sub>1</sub> n <sub>2</sub> |
| Hexadecimal Value | 1B 5C n <sub>1</sub> n <sub>2</sub> |
| Decimal Value     | 27 92 n <sub>1</sub> n <sub>2</sub> |
| Range             | $0 \leq n_1 n_2 \leq 255$           |

Causes the next print position to be moved to the right by the distance  $(n_1 + (n_2 * 256)) / 120$  inches in draft mode, and  $(n_1 + (n_2 * 256)) / 180$  inches in LQ mode.

## Vertical Movements

---

### LF

#### Line Feed.

|                   |    |
|-------------------|----|
| ASCII Code        | LF |
| Hexadecimal Value | 0A |
| Decimal Value     | 10 |

Position the paper down one line space as indicated by the current value of the line spacing increment at the left margin. This code is a line terminator. This code will terminate the double width-printing mode initiated by a received SO code. If the positioning causes the next line to exceed the form length, then the print head will move to the next top of form position.

---

### VT

#### Vertical tab.

|                   |    |
|-------------------|----|
| ASCII Code        | VT |
| Hexadecimal Value | 0B |
| Decimal Value     | 11 |

The vertical tab command advances the paper vertically to the next preprogrammed vertical tab position at the left margin. Eight Vertical Format Unit (VFU) channels are available and in each a maximum of 16 VT positions are allowed. This code is a line terminator.

---

## ESC B $n_1 n_2 \dots n_k$ NUL

### Vertical tabs.

|                   |                                          |
|-------------------|------------------------------------------|
| ASCII Code        | ESC B $n_1 n_2 \dots n_k$ NUL            |
| Hexadecimal Value | 1B 42 $n_1 n_2 \dots n_k$ NUL            |
| Decimal Value     | 27 66 $n_1 n_2 \dots n_k$ NUL            |
| Range             | $1 \leq n \leq 255$ , $1 \leq n \leq 16$ |

Sets vertical tab stops as indicated by parameter  $n_k$ . The parameters must be received in ascending order. The list of tab stops must be terminated by the NUL code. Tab stops are defined as line numbers at the current line spacing. Any line that is not referenced as a parameter within the command is cleared. Therefore using this sequence without any parameters will clear all vertical tab stops. There can be a maximum of 16 tab stops at any given time. The vertical tabs must be established by the user, as there are no vertical tabs set when the printer is turned on resulting in a vertical tab being executed as a linefeed, unless tabs previously set by host and stored in NVRAM.

---

## FF

### Form Feed.

|                   |    |
|-------------------|----|
| ASCII Code        | FF |
| Hexadecimal Value | 0C |
| Decimal Value     | 12 |

The form feed command will position the print head to the top of the next form at the left margin. This code is a line terminator.

---

## ESC J $n$

### Single variable line feed

|                   |           |
|-------------------|-----------|
| ASCII Code        | ESC J     |
| Hexadecimal Value | 1B 4A $n$ |
| Decimal Value     | 27 $n$    |

The print position will be moved the page  $n/180$  or  $n/216$ .

---

## ESC b c n<sub>1</sub> ... n<sub>k</sub> NUL

### Sets vertical tabs in VFU channels.

|                   |                                                                |
|-------------------|----------------------------------------------------------------|
| ASCII Code        | ESC b c n <sub>1</sub> ... n <sub>k</sub> NUL                  |
| Hexadecimal Value | 1B 62 c n <sub>1</sub> ... n <sub>k</sub> NUL                  |
| Decimal Value     | 27 98 c n <sub>1</sub> ... n <sub>k</sub> NUL                  |
| Range             | $0 \leq c \leq 7$<br>$0 \leq n \leq 255$<br>$1 \leq k \leq 16$ |

Sets vertical tabs in the channel 'c' at the position 'n<sub>k</sub>'. The parameter n<sub>k</sub> must be received in ascending order. The list of tab stops must be terminated by the NUL code. Tab stops are defined as line numbers at the current line spacing. Any line that is not referenced as a parameter within the command is cleared. Therefore using this sequence without any parameters will clear all vertical tab stops in that channel. There can be a maximum of 16 tabs per channel at any given time. The vertical tabs must be established by the user, as there are no vertical tabs set when the printer is turned on resulting in a vertical tab being executed as a linefeed.

---

## ESC j n

### Reverse n/180.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC j n             |
| Hexadecimal Value | 1B 6A n             |
| Decimal Value     | 27 106 n            |
| Range             | $0 \leq n \leq 255$ |

Causes a reverse line feed of n/180" or n/216" (see in the *System Menu*, under OTHER OPTIONS, the OPT:EPSON OGM function selected with the OPT:EPSON OGM>N (n/180)/OPT:EPSON OGM >Y (n/216) values, please refer to the *User's Manual* on the CD-Rom) after printing the data stored in the print buffer. Does not affect the current (forward) line spacing value.

|                                                                                |
|--------------------------------------------------------------------------------|
| <b>This command may be ignored if the Automatic Sheet Feeder is installed.</b> |
|--------------------------------------------------------------------------------|

---

## ESC / n

### Selects Vertical Format Unit Channel.

|                   |                   |
|-------------------|-------------------|
| ASCII Code        | ESC / n           |
| Hexadecimal Value | 1B 2F n           |
| Decimal Value     | 27 47 n           |
| Range             | $0 \leq n \leq 7$ |

Selects vertical format unit VFU channel. Subsequent VT codes will execute the vertical tabs by the ESC B and ESC b commands.

## Miscellaneous

---

## ESC

### Escape (control sequence introducer).

|                   |     |
|-------------------|-----|
| ASCII Code        | ESC |
| Hexadecimal Value | 1B  |
| Decimal Value     | 27  |

This code is used as a control sequence introducer. It implies that subsequent code(s) will define a given action of the printer.

---

## ESC s n

### Selects full/half speed printing.

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC s n  |
| Hexadecimal Value | 1B 73 n  |
| Decimal Value     | 27 115 n |

If the value of parameter  $n=1$ , then print speed will be reduced to half of the normal speed. If the value of parameter  $n=0$ , then the print speed will be normal.

---

## BEL

### Sounds the buzzer.

|                   |     |
|-------------------|-----|
| ASCII Code        | BEL |
| Hexadecimal Value | 07  |
| Decimal Value     | 7   |

Buzzer is sounded for approx. 0.5 sc. If a serie of bell codes is sent to the printer successively then the result will be a continuous buzzing sound approx. the number of seconds long corresponding to the number of bell codes sent.

It is required that other printer operations do not cease while the bell is sounding.

Bell response can be modified by menu (see in the *System Menu*, under OTHER OPTIONS, the OPT:BELL ENABLE function selected with the OPT:BELL ENBL>Y/OPT:BELL ENBL>N values, please refer to the *User's Manual* on the CD-Rom).

---

## ESC EM n

### Selects/deselects Automatic Sheet Feeder (ASF).

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC EM n |
| Hexadecimal Value | 1B 19 n  |
| Decimal Value     | 27 115 n |

Controls optional ASF paths for parking, loading & ejecting.

See the table in the following page:

| <b>n</b> | <b>ASF</b>                                                                                                                                                                |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0        | Reserved                                                                                                                                                                  |
| 1        | Selects Bin 1 for use after ejecting current sheet.                                                                                                                       |
| 2        | Selects Bin 2 for use after ejecting current sheet.                                                                                                                       |
| 3        | Selects Bin 3 for use after ejecting current sheet.                                                                                                                       |
| 4        | Enables ASF, printer online.                                                                                                                                              |
| C        | Selects and loads from Bin1, then loads from Bin 2 thereafter.                                                                                                            |
| R        | Ejects paper without loading another sheet. Printer will remain Online indicating Paper in condition. Incoming data will cause sheet to load from currently selected bin. |
| 8        | Parks current path. The maximum reverse distance is one form length for continuous forms. The current sheet is ejected for the ASF cut sheet forms. See NOTE below.       |
| 9        | Loads currently selected path. See NOTE below.                                                                                                                            |
| 10       | Selects and loads Front2 Push path (continuous forms). The current paper path will park or eject and the Front2 Push path is loaded. (Same as n = 13).                    |
| 11       | Selects and loads Front1 Push path (continuous forms). The current paper path will park or eject and the Front1 path is loaded. (Same as n = 12).                         |
| 12       | Selects and loads Front1 Push path (continuous forms). The current paper path will park or eject and the Front1 path is loaded. (Same as n = 11).                         |
| 13       | Selects and loads Front2 Push path (continuous forms). The current paper path will park or eject and the Front2 path is loaded. (Same as n = 10).                         |
| 14       | Reserved.                                                                                                                                                                 |
| 15       | Selects ASF bin 1. The current path will park and ASF bin 1 is loaded.                                                                                                    |
| 16       | Selects ASF bin 2. The current path will park and ASF bin 2 is loaded.                                                                                                    |
| 17       | Selects ASF bin 3. The current path will park and ASF bin 3 is loaded.                                                                                                    |

**Values of n = 1,2,3,C, R, are ignored if the ASF PATH has not been selected via n = 15, 16, 17 or from the operator panel.**

## NOTE:

- Between the time a form/page is parked/ejected and the next path is loaded, the interface will indicate a paper out condition. However, during loading from Front1 path or Front2 path or ASF path, if a paper out condition is detected, then the interface will indicate paper out.
- Selection of the Push-Pull path (if in the *System Menu*, under PATH OPTIONS, the PATH:TRACTOR function is selected with the PATH:TRACT>PSHPL value, please refer to the *User's Manual* on the CD-Rom) will prevent selection of the Front1, Front2 or ASF paths by this command.
- If CONFIRM PARK is selected (if in the *System Menu*, under OTHER OPTIONS, the OPT:CONFIRM PARK function is selected with the OPT:CNFRM PARK>Y value, please refer to the *User's Manual* on the CD-Rom) then prior to park current path, the paper will move to the tear-off position and the LCD will display: PLEASE TEAR OFF. Push the TEAR key or PARK/PATH key to enable subsequent parking of the form.
- If CONFIRM PARK is not selected (if in the *System Menu*, under OTHER OPTIONS, the OPT:CONFIRM PARK function is selected with the OPT:CNFRM PARK>N value, please refer to the *User's Manual* on the CD-Rom) then parking will be attempted without your intervention.

---

## SP

### Space.

|                   |    |
|-------------------|----|
| ASCII Code        | SP |
| Hexadecimal Value | 20 |
| Decimal Value     | 32 |

The space character will position the print head one character space to the right in normal character printing mode.

---

## DEL

### Deletes character.

|                   |     |
|-------------------|-----|
| ASCII Code        | DEL |
| Hexadecimal Value | 7F  |
| Decimal Value     | 127 |

This code causes the printer to delete the character received immediately prior to the DEL code from the print/input buffer.

---

## CAN

### Cancels data.

|                   |     |
|-------------------|-----|
| ASCII Code        | CAN |
| Hexadecimal Value | 18  |
| Decimal Value     | 24  |

This code will cause all printable data received since the last line terminator to be deleted. This code is a line terminator. The current print position will be retained. Printer response to this code is enabled/disabled by the CAN CODE selection (see in the *System Menu*, under OTHER OPTIONS, the OPT:CAN CODE function (OPT:CAN CODE>Y/OPT:CAN CODE>N), please refer to the *User's Manual* on the CD-Rom).

---

## DC1

### Selects printer or XON.

|                   |     |
|-------------------|-----|
| ASCII Code        | DC1 |
| Hexadecimal Value | 11  |
| Decimal Value     | 17  |

In the parallel interface mode, after the printer has been de-selected by DC3 this control code will set the parallel interface signals SLCT to a logic one condition and enable the printer to resume printing and cancel the STANDBY status. This code is enabled by menu (see in the *System Menu*, under PARALLEL OPTIONS, the PAR:RCV DC1/DC3 function, please refer to the *User's Manual* on the CD-Rom).

This implementation is different from the standard Epson printer in the following way: this printer does not use SLCTIN to use or not DC1/DC3.

When in the serial interface mode, this code is sent from the printer to the host to indicate that the printer is ready to receive data (XON) caused by any of the following conditions: Input buffer empty or Offline - Online from control panel after printer error conditions are cleared.

---

## NUL

### NUL.

|                   |     |
|-------------------|-----|
| ASCII Code        | NUL |
| Hexadecimal Value | 00  |
| Decimal Value     | 0   |

This code does not have an action associated with it when by it. It is used by other sequences (i.e. ESC B) to terminate a list of parameters. It can also serve as a valid parameter in certain escape sequences (ESC S NUL would cause superscripting to occur). It may also be used to indicate that no wires be fired in a column of dot graphics mode.

---

## ETX

### End of transmission.

|                   |     |
|-------------------|-----|
| ASCII Code        | ETX |
| Hexadecimal Value | 03  |
| Decimal Value     | 3   |

This code is used in conjunction with ACK for the ETX/ACK protocol. This protocol is enabled/disabled (see in the *System Menu*, under SERIAL OPTIONS, the SER:EXT/ACK function (SER:EXT/ACK>Y/SER:EXT/ACK>N), please refer to the *User's Manual* on the CD-Rom). The host transmits a block of characters followed by an ETX character. The host should transmit no more characters until it receives an ACK character from the printer. However, the host may choose to transmit multiple blocks of data terminated with ETX even though the printer has not transmitted ACK. The data source is responsible for ensuring that it does not transmit a string of data that exceeds the capacity of the printer's receive buffer. Throughput may be reduced when this protocol is enabled. It does not disable function of DC1/DC3 protocol. Not valid in parallel protocol.

---

## ACK

### Acknowledge.

|                   |     |
|-------------------|-----|
| ASCII Code        | ACK |
| Hexadecimal Value | 06  |
| Decimal Value     | 6   |

This code is used in conjunction with ETX for the ETX/ACK protocol. This protocol is enabled/disabled in System Menu (see in the *System Menu*, under SERIAL OPTIONS, the SER:EXT/ACK function (SER:EXT/ACK>Y/SER:EXT/ACK>N), please refer to the *User's Manual* on the CD-Rom). The printer will transmit ACK at the currently selected baud rate and bit/parity selection. Transmission of the ACK is delayed until an ETX has been removed in the input buffer. An ACK will be transmitted for each ETX received even if there are multiple ETX's in the buffer.

---

## ESC @

### **Resets printer.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC @ |
| Hexadecimal Value | 1B 40 |
| Decimal Value     | 27 64 |

Causes the printer to reset all functions and print modes to their power-on default state.

---

## ESC U n

### **Unidirectional printing ON/OFF.**

|                   |         |
|-------------------|---------|
| ASCII Code        | ESC U n |
| Hexadecimal Value | 1B 55 n |
| Decimal Value     | 27 85 n |

Causes printing to occur from left to right only.

If n is 01H, then unidirectional printing is activated. The escape sequence to print unidirectional will take effect at the point in the line where the escape is. Characters before the escape sequence may be printed left to right only.

If n is 00H, then unidirectional printing is canceled. The escape sequence to cancel should be the first thing in a line to be printed bi-directional.

If both the command to start and stop unidirectional print are in the same line the printer will act on the last one received.

---

## DC3

### Deselects printer or XOFF.

|                   |     |
|-------------------|-----|
| ASCII Code        | DC3 |
| Hexadecimal Value | 13  |
| Decimal Value     | 19  |

In the parallel interface, this control code will set the parallel interface signals SLCT to logic zero condition and disable the printer from printing received data. This is called the "STANDBY" status and the ON LINE led will flash (50%/50%) until you press the ONLINE key twice or until DC1 is received.

This code is enabled by System Menu (see in the *System Menu*, under PARALLEL OPTIONS, the PAR:RCV DC1/DC3 function, please refer to the *User's Manual* on the CD-Rom).

---

## ESC 6

### Enables expanded character set.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 6 |
| Hexadecimal Value | 1B 36 |
| Decimal Value     | 27 54 |

Enables character printing and disables control code execution in the range 03H-06H, 15H, 80H-9FH.

This command is recognized only if the Graphic set is enabled. That is, control codes are always executed if the italics set is enabled.

|                                                                                          |
|------------------------------------------------------------------------------------------|
| <b>See expanded character set table (also known as <a href="#">Character Set 2</a>).</b> |
|------------------------------------------------------------------------------------------|

---

## ESC 7

**Enables control code execution.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 7 |
| Hexadecimal Value | 1B 37 |
| Decimal Value     | 27 55 |

Enables control code execution and disables character printing in the range 03H-06H, 15H, 80H-9FH.

|                                                                                          |
|------------------------------------------------------------------------------------------|
| <b>See expanded character set table (also known as <a href="#">Character Set 1</a>).</b> |
|------------------------------------------------------------------------------------------|

---

## ESC #

**Cancels MSB control.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC # |
| Hexadecimal Value | 1B 23 |
| Decimal Value     | 27 35 |

This command sets most significant bit (MSB) control selected by the ESC > (MSB =1) and (MSB = 0) commands.

## ESC & NUL n m a<sub>0</sub> a<sub>1</sub> d<sub>1</sub> ....d<sub>x</sub>

**Defines the 24-pin Download Characters.**

|                   |                                                                                                                         |
|-------------------|-------------------------------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC & NUL n m a <sub>0</sub> a <sub>1</sub> d <sub>1</sub> ....d <sub>x</sub>                                           |
| Hexadecimal Value | 1B 26 00 n m a <sub>0</sub> a <sub>1</sub> d <sub>1</sub> ....d <sub>x</sub>                                            |
| Decimal Value     | 27 38 0 n m a <sub>0</sub> a <sub>1</sub> d <sub>1</sub> ....d <sub>x</sub>                                             |
| Range             | $0 \leq n \leq 127$<br>$0 \leq m \leq 127$<br>$0 \leq d_x \leq 255$<br>a <sub>0</sub> , a <sub>1</sub> , a <sub>2</sub> |

This escape sequence is used to download fonts into the printer. Once fonts have been downloaded they can be selected by ESC %. Parameter n is the character position of the first character and parameter m is the character position of the last character to be downloaded. For example, to download character "RST" the user would specify n=52H and m=54H. Characters must be downloaded to consecutive positions after the first character. The parameter a<sub>0</sub>, a<sub>1</sub> and a<sub>2</sub> must be sent for each character being downloaded and are known as the attribute bytes. Parameter a<sub>0</sub> specifies the n° of dot columns to be added before the character. Parameter a<sub>1</sub> specifies the width of the character. Parameter a<sub>2</sub> specifies the n° of dot columns to add after the character. The parameters d<sub>1</sub> ... d<sub>x</sub> represent the dot column data being downloaded for each character. 2 or 3 data bytes represent 1 column of dots depending upon the print mode type as shown below:

| <b>LQ</b>                                      |              |              |              |             |               | <b>DRAFT</b> |               |
|------------------------------------------------|--------------|--------------|--------------|-------------|---------------|--------------|---------------|
|                                                | <b>10cpi</b> | <b>12cpi</b> | <b>15cpi</b> | <b>Prop</b> | <b>Script</b> | <b>Norm</b>  | <b>Script</b> |
| a <sub>1</sub>                                 | 29           | 23           | 15           | 39          | 23            | 9            | 7             |
| a <sub>0</sub> +a <sub>1</sub> +a <sub>2</sub> | 36           | 30           | 24           | 42          | 36            | 12           | 12            |

Draft, Letter Quality and Super/Subscript fonts can be downloaded. It is necessary to select the desired print mode prior to sending the download data. Each dot column has a width of 1/120" in draft, and 1/360" in Letter Quality. Following are limits of parameters a<sub>0</sub>, a<sub>1</sub> and a<sub>2</sub> for LQ, DRAFT and Super/Subscript print modes at various character pitches.

The mapping of data bits to wires is as follows:

|               |              | <b>LQ</b>     | <b>DRAFT</b>  | <b>SUPER SCRIPT</b>                                                | <b>SUB SCRIPT</b> |
|---------------|--------------|---------------|---------------|--------------------------------------------------------------------|-------------------|
| <b>BYTE #</b> | <b>BIT #</b> | <b>WIRE #</b> | <b>WIRE #</b> | <b>WIRE #</b>                                                      | <b>WIRE #</b>     |
| 1             | 7            | 1             | 1             | 1                                                                  | 9                 |
|               | 6            | 2             | 2             | 2                                                                  | 10                |
|               | 5            | 3             | 3             | 3                                                                  | 11                |
|               | 4            | 4             | 4             | 4                                                                  | 12                |
|               | 3            | 5             | 5             | 5                                                                  | 13                |
|               | 2            | 6             | 6             | 6                                                                  | 14                |
|               | 1            | 7             | 7             | 7                                                                  | 15                |
|               | 0            | 8             | 8             | 8                                                                  | 16                |
| 2             | 7            | 9             | 9             | 9                                                                  | 17                |
|               | 6            | 10            | 10            | 10                                                                 | 18                |
|               | 5            | 11            | 11            | 11                                                                 | 19                |
|               | 4            | 12            | 12            | 12                                                                 | 20                |
|               | 3            | 13            | 13            | 13                                                                 | 21                |
|               | 2            | 14            | 14            | 14                                                                 | 22                |
|               | 1            | 15            | 15            | 15                                                                 | 23                |
|               | 0            | 16            | 16            | 16                                                                 | 24                |
| 3             | 7            | 17            | 17            | NOTE:<br>Only 2 Bytes are required for super/subscript characters. |                   |
|               | 6            | 18            | 18            |                                                                    |                   |
|               | 5            | 19            | 19            |                                                                    |                   |
|               | 4            | 20            | 20            |                                                                    |                   |
|               | 3            | 21            | 21            |                                                                    |                   |
|               | 2            | 22            | 22            |                                                                    |                   |
|               | 1            | 23            | 23            |                                                                    |                   |
|               | 0            | 24            | 24            |                                                                    |                   |

If a data bit has a value of 01H, then the corresponding wire is fired. If a data bit has a value of 00H, then the wire is not fired. In general the user of this feature must be careful that the number of bytes of download information is equal to 3-x width of the character being defined (a<sub>1</sub>) or the results will be unpredictable.

Only one print mode type may be downloaded at a time. That is, if draft characters have been downloaded. Then selecting Letter quality and downloading characters will cause the draft download characters to be cleared. This applies similarly to script characters.

---

## **ESC: NUL n NUL**

### **Copies resident font to download RAM.**

|                   |                |
|-------------------|----------------|
| ASCII Code        | ESC: NUL n NUL |
| Hexadecimal Value | 1B 3A 00 n 00  |
| Decimal Value     | 27 58 0 n 0    |

If LQ mode is active, then this command causes the resident font specified by n to be copied into the Download buffer RAM, where values of n are as specified in the **ESC k** command.

If DRAFT mode is active, then resident draft font is copied into the download buffer RAM.

---

## ESC <

### Immediate carriage return.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC < |
| Hexadecimal Value | 1B 3C |
| Decimal Value     | 27 60 |

Causes the print head to move to the left margin position, effectively causing unidirectional (left-to-right) printing for one line.

---

## ESC =

### Sets MSB equal to zero (0).

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC = |
| Hexadecimal Value | 1B 3D |
| Decimal Value     | 27 61 |

This command sets the most significant bit (MSB) of received data to zero regardless of the logic state of the bit at the time it is received. Cancels the ESC # and ESC > commands.

---

## ESC >

### Sets MSB equal to one (1).

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC > |
| Hexadecimal Value | 1B 3E |
| Decimal Value     | 27 62 |

This command sets the most significant bit (MSB) of received data to one regardless of the logic state of the bit at the time it is received. Cancels the ESC # and ESC= commands.

## ESC [ - n<sub>1</sub> n<sub>2</sub> m d<sub>1</sub> d<sub>2</sub>

**Selects the score line.**

|                   |                                                                        |
|-------------------|------------------------------------------------------------------------|
| ASCII Code        | ESC [ - n <sub>1</sub> n <sub>2</sub> m d <sub>1</sub> d <sub>2</sub>  |
| Hexadecimal Value | 1B 5B 2D n <sub>1</sub> n <sub>2</sub> m d <sub>1</sub> d <sub>2</sub> |
| Decimal Value     | 27 91 45 n <sub>1</sub> n <sub>2</sub> m d <sub>1</sub> d <sub>2</sub> |
| Range             | n <sub>1</sub> = 03H, n <sub>2</sub> = 0H, m = 01H                     |

Selects the type of score that overwrites characters:

| <b>d<sub>1</sub></b> | <b>SPECIFIES SCORE LOCATION</b> |
|----------------------|---------------------------------|
| 01H                  | Underline position              |
| 02H                  | Strike-through position         |
| 03H                  | Overline position               |

To select {type}:

| <b>d<sub>2</sub></b> | <b>SPECIFIES SCORE STYLE</b> |
|----------------------|------------------------------|
| 0H                   | Cancel current score         |
| 01H                  | Single continuous line       |
| 02H                  | Double continuous line       |
| 05H                  | Single discontinuous line    |
| 06H                  | Double discontinuous line    |

---

## ESC [ p<sub>1</sub>;p<sub>2</sub> SP ~

### Selects emulation.

|                   |                                               |
|-------------------|-----------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ;p <sub>2</sub> SP ~     |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 20 7E  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 32 126 |

This sequence will switch the emulation of the printer to another available emulation.

- p<sub>1</sub>: Emulation identifier. This parameter will select the particular emulation by a reference number that can be found in the description of the table.
- p<sub>2</sub>: Reset control. The parameters of the printer (tabs, margins, page length, etc.) to be reset or defaulted are controlled by this parameter.

| <b>p<sub>1</sub></b> | <b>EMULATION</b>           |
|----------------------|----------------------------|
| 0                    | GENICOM ANSI               |
| 23                   | IBM Proprinter XL24/XL 24E |
| 24                   | EPSON LQ 1050-2550         |

| <b>p<sub>2</sub></b> | <b>SWITCH CONDITION</b>              |
|----------------------|--------------------------------------|
| 0                    | Printer parameters maintained        |
| 1                    | Printer parameters reset to defaults |

Indeterminate Conditions: If no emulation parameter is supplied, the emulation will remain in the current state and the rest of the sequence ignored. Other parameter values and other parameters are reserved.

# Basic Program Sample

```
100 DEFSTR E:ESC=CHR$(27) 'Define Escape character
110 WIDTH "LPT1:",255
120 LPRINT "FOLLOWING ARE SOME OF THIS PRINTER'S ";
121 LPRINT "FEATURES USING THE EPSON EMULATION"
130 LPRINT ESC;"P";"10 CPI (PICA)"
140 LPRINT ESC;"M";"12 CPI (ELITE)"
150 LPRINT ESC;"g";"15 CPI"
160 LPRINT ESC;"P";"10 CPI"
170 LPRINT
180 LPRINT ESC;"p";CHR$(1);"PROPORTIONAL MODE"
190 LPRINT ESC;"p";CHR$(0);"BACK TO NORMAL"
200 LPRINT
210 LPRINT CHR$(14);"DOUBLE-WIDE MODE"
220 LPRINT CHR$(20);"BACK TO NORMAL"
230 LPRINT
240 LPRINT ESC;"E";"EMPHASIZED PRINTING"
250 LPRINT ESC;"F";"BACK TO NORMAL"
260 LPRINT ESC;"G";"DOUBLE STRIKE PRINTING"
270 LPRINT ESC;"H";"BACK TO NORMAL"
280 LPRINT
290 LPRINT ESC;"S";CHR$(0);"SUPERSCRIPIT";ESC;"T";"/";
300 LPRINT ESC;"S";CHR$(1);"SUBSCRIPT ";ESC;"T";"MODE"
310 LPRINT
320 LPRINT ESC;"-";CHR$(1);"UNDERLINE MODE"
330 LPRINT ESC;"-";CHR$(0);"BACK TO NORMAL"
340 LPRINT
350 LPRINT "0          1          2          3";
351 LPRINT "          4          5          6";
360 LPRINT "0123456789012345678901234567890";
361 LPRINT "123456789012345678901234567890"
370 LPRINT
380 LPRINT ESC;"x";CHR$(0);"DRAFT PRINT MODE"
390 LPRINT ESC;"a";CHR$(3);
400 LPRINT ESC;"l";CHR$(10);
410 LPRINT ESC;"Q";CHR$(40);
420 LPRINT "LEFT MARGIN NOW BEGINS AT 10TH COLUMN ";
421 LPRINT "AND RIGHT MARGIN NOW ENDS AT 40TH COLUMN."
430 LPRINT ESC;"l";CHR$(0);
440 LPRINT ESC;"Q";CHR$(136)
450 LPRINT "LEFT MARGIN NOW BEGINS AT 0TH COLUMN ";
451 LPRINT "AND RIGHT MARGIN NOW ENDS AT 136TH COLUMN."
460 LPRINT
470 LPRINT ESC;"x";CHR$(1);ESC;"k";CHR$(3);"LQ PRINT ";
471 LPRINT "MODE (Prestige)"
480 LPRINT
490 LPRINT ESC;"2";
500 FOR I=1 TO 3
510 LPRINT "1/6 INCH LINE FEED"
520 NEXT I
530 LPRINT
540 LPRINT ESC;"0";
550 FOR J=1 TO 3
560 LPRINT "1/8 INCH LINE FEED"
570 NEXT J
580 LPRINT ESC;"2";"NOW 1/6 INCH LINE FEED"
590 LPRINT "A FORMFEED <PF> FOLLOWS THIS LINE";CHR$(12)
600 END
```

# Basic Program Printed Output

FOLLOWING ARE SOME OF THIS PRINTER'S FEATURES USING THE EPSON EMULATION

10 CPI (PICA)

12 CPI (ELITE)

15 CPI

10 CPI

PROPORTIONAL MODE

BACK TO NORMAL

DOUBLE-WIDE MODE

BACK TO NORMAL

EMPHASIZED PRINTING

BACK TO NORMAL

DOUBLE STRIKE PRINTING

BACK TO NORMAL

SUPERSCRIPT/SUBSCRIPT MODE

UNDERLINE MODE

BACK TO NORMAL

0 1 2 3 4 5 6  
012345678901234567890123456789012345678901234567890

DRAFT PRINT MODE

LEFT MARGIN NOW BEGINS AT 10TH  
COLUMN AND RIGHT MARGIN NOW EN  
DS AT 40TH COLUMN.

LEFT MARGIN NOW BEGINS AT 0TH COLUMN AND RIGHT MARGIN NOW ENDS AT 136TH COLUMN.

LQ PRINT MODE (Prestige)

1/6 INCH LINE FEED

1/6 INCH LINE FEED

1/6 INCH LINE FEED

1/8 INCH LINE FEED

1/8 INCH LINE FEED

1/8 INCH LINE FEED

NOW 1/6 INCH LINE FEED

A FORMFEED <FF> FOLLOWS THIS LINE

# IBM Emulation Commands

The following printer commands are supported by this printer according to the IBM XL-24E/XL24 emulation

## IBM Command Descriptions

### Setting Form Length

---

#### ESC C n

**Sets page length (lines per page).**

|                   |                               |
|-------------------|-------------------------------|
| ASCII Code        | ESC C n                       |
| Hexadecimal Value | 1B 43 n                       |
| Decimal Value     | 27 67 n                       |
| Range             | $1 \leq n \leq 225$ (Decimal) |

Sets the forms length to a size specified by the parameter n in lines. When this command is recognized, the form length is converted to an absolute value based on the current line spacing. Therefore future changes of line spacing will not effect the forms length.

This command will reset the perforation skip value to zero (only if in the *System Menu*, the CLEAR MARGINS function, under OTHER OPTIONS, is selected OPT:CLR MRGN>Y value) and will set a new Top of Form at the current line position. The first line of a form is line 1.

This command has precedence over menu selection of form length.

---

## ESC C NUL n

### Sets page length (inches per page).

|                   |                               |
|-------------------|-------------------------------|
| ASCII Code        | ESC C NUL n                   |
| Hexadecimal Value | 1B 43 00 n                    |
| Decimal Value     | 27 67 0 n                     |
| Range             | $1 \leq n \leq 225$ (Decimal) |

Sets the form length to a size specified by the parameter n in inches. This command will reset the perforation skip value to zero (only if in the *System Menu*, the CLEAR MARGINS function, under OTHER OPTIONS, is selected OPT:CLR MRGN>Y value) and will set a new Top of Form at the current line position. The 1<sup>st</sup> line of a form is line 1. This command has precedence over menu selection of form length. All values are allowed (greater than 85 are not recommended): a value of zero will leave the previous value in force. If the page length to be set is smaller than the current line spacing setting, then the command is ignored.

---

## ESC N n

### Sets skip perforation.

|                   |                               |
|-------------------|-------------------------------|
| ASCII Code        | ESC N n                       |
| Hexadecimal Value | 1B 4E n                       |
| Decimal Value     | 27 78 n                       |
| Range             | $1 \leq n \leq 255$ (Decimal) |

With continuous forms, this command allows setting a bottom margin region, normally used to avoid printing on the perforation. The parameter is presented in rows (lines) to skip. It will be converted to an absolute distance based on the current VMI value. When form length is changed the skip perforation is reset (only if in the *System Menu*, the CLEAR MARGINS function, under OTHER OPTIONS, is selected OPT:CLR MRGN>Y value). This command overrides menu selection (see in the *Operational Menu*, under PAGE SETUP, the PAGE:BOT MARGIN value, please refer to the *User's Manual* on the CD-Rom). A parameter value of zero will leave the previous setting unaltered. A VT or LF into the skip area will cause the printer to move to the first line of the next form.

---

## ESC O

**Disables the skip perforation.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC O |
| Hexadecimal Value | 1B 4F |
| Decimal Value     | 27 79 |

Resets the skip perforation value to zero. It overrides menu selection (see in the *Operational Menu*, under PAGE SETUP, the PAGE:BOT MARGIN value, please refer to the *User's Manual* on the CD-Rom).

## Setting Character and Line Spacing

---

### ESC :

**Selects 12 cpi.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC : |
| Hexadecimal Value | 1B 3A |
| Decimal Value     | 27 58 |

Sets printing mode at 12 cpi. Receipt of a doublewide command will cause printing to change to 6 cpi: Receipt of a DC2 will cause the printer to resume printing at 10 or 5 cpi. This command has precedence over SI code.

---

### ESC g

**Selects 15 cpi.**

|                   |        |
|-------------------|--------|
| ASCII Code        | ESC g  |
| Hexadecimal Value | 1B 67  |
| Decimal Value     | 27 103 |

Selects printing mode at 15 cpi.

---

## SI

### **Enables compressed printing.**

|                   |    |
|-------------------|----|
| ASCII Code        | SI |
| Hexadecimal Value | OF |
| Decimal Value     | 15 |

This code will enable the compressed printing mode. Character printing will be changed to 17.16, 20 or 24 cpi dependent upon the menu selection (see in the *System Menu*, under IBM OPTIONS, the IBM:COMP CHR function, please refer to the *User's Manual* on the CD-Rom).

Double wide (by both SO and ESC W) and compressed printing will produce the equivalent of 1/2 the current compressed density.

The spacing of the tab is compressed because they are stored in columns. Margins previously set by the ESC X are not affected by this command. Margins established after the SI command will be based upon the compressed CPI values.

---

## DC2

### **Cancels compressed printing.**

|                   |     |
|-------------------|-----|
| ASCII Code        | DC2 |
| Hexadecimal Value | 12  |
| Decimal Value     | 18  |

Cancels the compressed printing mode. The printing will resume at 10 or 5 cpi (double width) as previously selected.

---

## ESC 0

### Sets 1/8-inch line spacing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 0 |
| Hexadecimal Value | 1B 30 |
| Decimal Value     | 27 48 |

Sets the spacing between lines to 1/8 inch (8 lpi).

---

## ESC P n

### Selects or cancels proportional mode.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC P n             |
| Hexadecimal Value | 1B 50 n             |
| Decimal Value     | 27 80 n             |
| Range             | $0 \leq n \leq 255$ |

When n is odd, proportional spacing is started.

When n is even, proportional spacing is stopped.

Any pitch change will also cancel proportional spacing. If proportional spacing is enabled and an ESC P {n=odd} sequence is received, then the previously selected mode and cpi will be selected upon exiting proportional spacing.

---

## ESC A n

### Stores text line spacing.

|                   |                    |
|-------------------|--------------------|
| ASCII Code        | ESC A n            |
| Hexadecimal Value | 1B 41 n            |
| Decimal Value     | 27 65 n            |
| Range             | $1 \leq n \leq 85$ |

Sets the spacing between lines to  $n/60$ " (if AGM enabled) to  $n/72$ " (if AGM not enabled). See in the *System Menu*, under IBM OPTIONS, the IBM:AGM MODE>Y/N functions, please refer to the *User's Manual* on the CD-Rom.

If AGM is not enabled (IBM:AGM MODE>N) then an ESC 2 sequence must be received in order to set the ESC A setting.

If AGM is enabled (IBM:AGM MODE>Y) and if ESC 2 is received, then 1/6-inch spacing is set.

Illegal parameters will cause the sequence to be ignored.

---

## ESC 2

### Sets ESC A text line spacing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 2 |
| Hexadecimal Value | 1B 32 |
| Decimal Value     | 27 50 |

Sets the line spacing to the value supplied by the last ESC A sequence. If the AGM is enabled (see in the *System Menu*, under IBM OPTIONS, the IBM:AGM MODE>Y function, please refer to the *User's Manual* on the CD-Rom), then ESC 2 is not used to enable text line spacing, but will set line spacing to 6 lpi. If no ESC A sequence was received prior to this command, then the line spacing will change to 1/6-inch spacing (6 lpi).

---

## ESC 1

### Sets 7/72-inch line spacing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 1 |
| Hexadecimal Value | 1B 31 |
| Decimal Value     | 27 49 |

Sets the spacing between lines to 7/72 inch. Not available when IBM:AGM MODE>Y is selected in the *System Menu* (please refer to the *User's Manual* on the CD-Rom).

---

## ESC 3 n

### Sets graphics line spacing.

|                   |                               |
|-------------------|-------------------------------|
| ASCII Code        | ESC 3                         |
| Hexadecimal Value | 1B 33 n                       |
| Decimal Value     | 27 51 n                       |
| Range             | $0 \leq n \leq 255$ (Decimal) |

Sets the line spacing increments of

n/180 inch, if AGM enabled or VSU = 1/180,

n/216 inch, if AGM disabled or VSU = 1/216.

See in the *System Menu*, under IBM OPTIONS, the IBM:AGM MODE>Y/N functions, please refer to the *User's Manual* on the CD-Rom.

## ESC [ \ n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>

### Sets vertical units.

|                   |                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC [ \ n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub>  |
| Hexadecimal Value | 1B 5B 5C n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> |
| Decimal Value     | 27 91 92 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> |

This escape sequence sets the base vertical, or line spacing, increment for the ESC A, ESC J and ESC 3 commands.

|                |                |                                                |
|----------------|----------------|------------------------------------------------|
| n <sub>1</sub> | n <sub>2</sub> | specify number of parameter bytes that follow: |
|----------------|----------------|------------------------------------------------|

| m <sub>2</sub> | m <sub>1</sub> | specify text (ESC A only) line spacing increment | m <sub>4</sub> | m <sub>3</sub> | specify graphics (ESC 3, ESC J) line spacing increment |
|----------------|----------------|--------------------------------------------------|----------------|----------------|--------------------------------------------------------|
| 00             | 00             | no change from current setting                   | 00             | 00             | no change from current setting                         |
| 00             | 30             | 1/48" increment                                  | 00             | 30             | 1/48" increment                                        |
| 00             | 48             | 1/72" increment                                  | 00             | 48             | 1/72" increment                                        |
| 00             | 60             | 1/96" increment                                  | 00             | 60             | 1/96" increment                                        |
| 00             | 78             | 1/120" increment                                 | 00             | 78             | 1/120" increment                                       |
| 00             | 90             | 1/144" increment                                 | 00             | 90             | 1/144" increment                                       |
| 00             | B4             | 1/180" increment                                 | 00             | B4             | 1/180" increment                                       |
| 00             | D8             | 1/216" increment                                 | 00             | D8             | 1/216" increment                                       |
| 00             | F0             | 1/240" increment                                 | 00             | F0             | 1/240" increment                                       |
| 00             | A0             | 1/1440" increment                                | 00             | A0             | 1/1440" increment                                      |

# Setting Print Attributes

---

## DC4

**Cancels double-width printing.**

|                   |     |
|-------------------|-----|
| ASCII Code        | DC4 |
| Hexadecimal Value | 14  |
| Decimal Value     | 20  |

Cancels double-width printing initiated by a SO code and returns to the previously selected print compression.

---

## SO

**Selects double-width printing.**

|                   |    |
|-------------------|----|
| ASCII Code        | SO |
| Hexadecimal Value | 0E |
| Decimal Value     | 14 |

This code will enable double-width printing for subsequent characters until a line terminator, a DC4 code or an ESC W sequence is received. Character printing will cause each character to be printed twice its current width by printing a given dot column twice at the current DPI (CPI) in effect. The characters are expanded to take up two character spaces each, but the tab positions are not changed. That means that for the power up default tabs, only four doublewide characters can be printed between tab stops.

If 12-cpi-print is invoked then double wide is invoked, the character will print at 6 cpi.

---

## ESC W n

**Selects or cancels double-width printing.**

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC W n             |
| Hexadecimal Value | 1B 57 n             |
| Decimal Value     | 27 87 n             |
| Range             | $0 \leq n \leq 255$ |

This command will enable continuous double width printing for subsequent characters with any odd parameter value (such as SOH). Character printing will have each character elongated to twice its current width. Any even parameter value, (such as NUL), will disable the double-width printing mode.

The double wide by `ESC [ @ 4,0,0,0,0, 2` is equivalent to double wide by ESC W1.

The code to cancel double wide by `ESC [ @ 4,0,0,0,0,1` is equivalent to ESC W0.

These codes may be used interchangeably and have the same effect. The parameters that choose double high and double line feed have no effect on double wide whether it is chosen by this escape sequence or by ESC W n.

---

## ESC [ @ n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>

**Selects double-high printing.**

ASCII Code                ESC [ @ n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>

Hexadecimal Value        1B 5B 40 n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>

Decimal Value            27 91 64 n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>

This command selects double high, doublewide and double line feed options. The following parameter values are allowed:

n<sub>1</sub>                always 4

n<sub>2</sub>                always 0

m<sub>1</sub>                always 0

m<sub>2</sub>                always 0

m<sub>3</sub>                character height and line feeds:

|            |        | Character Height |        |        |
|------------|--------|------------------|--------|--------|
|            |        | Unch             | Single | Double |
| Line Feeds | Unch   | 0                | 1      | 2      |
|            | Single | 16               | 17     | 18     |
|            | Double | 32               | 33     | 34     |

m<sub>4</sub>                character width:

0 = current value

1 = single wide

2 = double wide

---

## ESC E

### Selects emphasized printing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC E |
| Hexadecimal Value | 1B 45 |
| Decimal Value     | 27 69 |

This command will cause subsequent character printing to be emphasized.

Emphasized printing is defined as printing a dot twice with 1/360 inch horizontal spacing between dots.

---

## ESC F

### Cancels emphasized printing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC F |
| Hexadecimal Value | 1B 46 |
| Decimal Value     | 27 70 |

Cancels the emphasized printing mode started by ESC E.

---

## ESC G

### Selects double-strike printing.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC G |
| Hexadecimal Value | 1B 47 |
| Decimal Value     | 27 71 |

This command will cause subsequent character printing to be double strike.

Double strike is accomplished by making two passes of the same printable data with no displacement between dots of the first and second pass.

---

## ESC H

### **Cancels double-strike printing.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC H |
| Hexadecimal Value | 1B 48 |
| Decimal Value     | 27 72 |

Cancels the double-strike-printing mode started by ESC G.

---

## ESC \_ n

### **Continuous overstrikes.**

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC _ n             |
| Hexadecimal Value | 1B 5F n             |
| Decimal Value     | 27 95 n             |
| Range             | $0 \leq n \leq 255$ |

This escape sequence will cause all subsequent characters to be over struck if n is an odd parameter and will end continuous overstrike if n is an even parameter.

---

## ESC S n

### **Selects subscript or superscript printing.**

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC S n             |
| Hexadecimal Value | 1B 53 n             |
| Decimal Value     | 27 83 n             |
| Range             | $0 \leq n \leq 255$ |

Enables the super or subscript-printing mode.

If the parameter is an even value (such as NUL), then superscripting will be done.

If it is an odd value (such as SOH), then subscripting will be done.

In each of these modes, the characters will be shortened to half height and then positioned in the upper (superscript) or lower (subscript) half of the print line. These modes are mutually exclusive of each other and therefore the last one received is active.

---

---

## ESC T

**Cancels subscript or superscript printing.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC T |
| Hexadecimal Value | 1B 54 |
| Decimal Value     | 27 84 |

Cancels the super or subscript-printing mode. Characters return to their prior size at the previous baseline position.

---

## ESC b

**Selects the Black (top/1st) color band.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC b |
| Hexadecimal Value | 1B 62 |
| Decimal Value     | 27 98 |

Selects the Black (top) band of a color ribbon or one of the black bands of a Red/Black ribbon for printing. This required that the order of colors in the color ribbon be predetermined.

This command will not override the automatic ribbon shift in effect when the Black ribbon and Red/Black ribbon is installed and selected by menu (see in the *System Menu*, under OTHER OPTIONS, the OPT:RIBBON TYPE function, please refer to the *User's Manual* on the CD-Rom). The color order is as follows:

|        |   | PROCESS RIBBON | RED/BLACK RIBBON |
|--------|---|----------------|------------------|
| TOP    | 1 | Black          | Red              |
|        | 2 | Cyan           | Black            |
|        | 3 | Magenta        | Black            |
| BOTTOM | 4 | Yellow         | Black            |

Ignored if Black ribbon selected by the *System Menu* (OPT:RBN>BLACK value selected).

---

## ESC c

### Selects the Cyan (2nd) color band.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC c |
| Hexadecimal Value | 1B 63 |
| Decimal Value     | 27 99 |

Selects the 2<sup>nd</sup> color band of color process ribbon. See [ESC b](#) for details.

Ignored if process ribbon not selected by *System Menu* (see, under OTHER OPTIONS, the RIBBON TYPE function (OPT:RBN>PROCESS value) in the *User's Manual* on the CD-Rom).

---

## ESC m

### Selects the Magenta (3rd) color band.

|                   |        |
|-------------------|--------|
| ASCII Code        | ESC m  |
| Hexadecimal Value | 1B 6D  |
| Decimal Value     | 27 109 |

Selects the 3rd band of color process ribbon and red band of Red/black ribbon for printing. See [ESC b](#) for details.

Ignored if process ribbon not selected by *System Menu* (see, under OTHER OPTIONS, the RIBBON TYPE function (OPT:RBN>PROCESS value) in the *User's Manual* on the CD-Rom).

---

## ESC y

**Selects the Yellow (4th) color band.**

|                   |        |
|-------------------|--------|
| ASCII Code        | ESC y  |
| Hexadecimal Value | 1B 79  |
| Decimal Value     | 27 121 |

Selects the 4th band of color process ribbon for printing. See [ESC b](#) for details.

Ignored if process ribbon not selected by *System Menu* (see, under OTHER OPTIONS, the RIBBON TYPE function (OPT:RBN>PROCESS value) in the *User's Manual* on the CD-Rom).

## BarCode Selection

---

### ESC [ u n

**Activates/cancels barcode mode.**

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC [ u n           |
| Hexadecimal Value | 1B 5B 75 n          |
| Decimal Value     | 27 91 117 n         |
| Range             | $0 \leq n \leq 255$ |

Activates Barcode mode if n = odd value.

Cancels Barcode mode if n = even value.

---

### ESC [ v n m

**Sets barcode parameters.**

|                   |               |
|-------------------|---------------|
| ASCII Code        | ESC [ v n m   |
| Hexadecimal Value | 1B 5B 76 n m  |
| Decimal Value     | 27 91 118 n m |

Sets barcode parameters according to the table in the following page.

Parameter values that are not supported result in the command being ignored.

| <b>n</b> | <b>(Parameter Description)</b> | <b>m (Parameter Limits)</b> | <b>Value</b> |
|----------|--------------------------------|-----------------------------|--------------|
| 0        | Barcode style                  | See below                   | 4            |
| 1        | Barcode height                 | 1 -120 (1/12" increments)   | 12           |
| 2        | Human Readable line            | 0=disable; 1=enable         | 1            |
| 3        | Narrow bar width               | 2-255                       | 3            |
| 4        | Wide bar width                 | 2-255                       | 7            |
| 5        | Narrow space width             | 2-255                       | 3            |
| 6        | Wide space width               | 2-255                       | 7            |
| 7        | Intercharacter space width     | 2-255                       | 3            |
| 8        | Rotation                       | 0-4                         | 0            |
| 9        | Horizontal print density       | 1=120;2=144;3=180           | 1            |
| 10       | Check digit                    | 0-1                         | 0            |
| 11       | Human Readable font            | 0-4                         |              |
| 12       | Barcode height                 | 0-240 (1/24 "increment)     | 0            |

## Barcode Styles Supported:

| <b>m</b> | <b>STYLE</b>                       |
|----------|------------------------------------|
| 0        | Interleaved 2 of 5                 |
| 1        | Bi-directional 2 of 5              |
| 2        | Matrix 2 of 5                      |
| 3        | Industrial 2 of 5                  |
| 4        | Code 3 of 9 (default)              |
| 5        | EAN-8                              |
| 6        | EAN-13                             |
| 7        | Code 11                            |
| 9        | Codabar (default start/stop = a/t) |
| 10       | Codabar (default start/stop = b/n) |
| 11       | Codabar (default start/stop = c/*) |
| 12       | Codabar (default start/stop = d/e) |
| 13       | UPC-A                              |
| 14       | UPC-E                              |
| 15       | Code 93                            |
| 16       | Code 128 (subsets A/B/C)           |
| 17       | Code 128                           |
| 18       | Code 128                           |
| 19       | MSI                                |
| 20       | UPC 2 Supplemental                 |
| 21       | UPC 5 Supplemental                 |
| 22       | EAN 2 Supplemental                 |
| 23       | EAN 5 Supplemental                 |
| 50       | Postnet                            |

This barcode implementation differs from the ANSI implementation in two ways:

- The parameter values above are binary values (ASCII in ANSI mode).
- The "set parameters command" permits changing of only one parameter at a time.

# Character Set Selection

---

**ESC = n m id sa<sub>1</sub> sa h d<sub>1</sub> ... d<sub>n</sub>**

**Defines downloaded characters/table.**

|                   |                                                                     |
|-------------------|---------------------------------------------------------------------|
| ASCII Code        | ESC = n m id sa <sub>1</sub> sa h d <sub>1</sub> ... d <sub>n</sub> |
| Hexadecimal Value | 1B 3D n m id sa <sub>1</sub> sa h d <sub>1</sub> ... d <sub>n</sub> |
| Decimal Value     | 27 61 n m id sa <sub>1</sub> sa h d <sub>1</sub> ... d <sub>n</sub> |

Downloads character data, lookup table data, and the font descriptor byte:

n (m\*256) Count of number of bytes included in sequence; data beyond count value will be printed as normal data.

id Must be 23H.

sa<sub>1</sub>, sa<sub>h</sub> Starting address (low, high, respectively) for:  
position the character data when defining downloaded characters;  
position of lookup table data defined when defining lookup table data.

d<sub>1</sub> ... d<sub>n</sub> Character or lookup table data defined as follows:

d<sub>1</sub>,d<sub>h</sub> Starting address (low, high) of character's image in character memory.

attr1 Attribute byte defined as follows:

Bit 7=1: indicates block graphic character.

Bit 7=0: indicates normal character.

Bit 6=1: indicates downloaded character.

Bit 6=0: indicates resident character.

Bits 5-0: number of character data dot columns stored in memory.

attr2 Bit      7 6

0 0 shading character.

0 1 line drawing character.

1 0 underscore character.

1 not supported.

Bits      5-0 number of dot columns of character printed minus 1.

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cmprsn<br>5-9 | Compression mask. One bit per dot-column with bit 7 of byte 5 mapping to the leftmost column. For a character with 36 dot-columns when decompressed bit 4 of byte 0 would map to the rightmost column. All zeros indicate that a character is not compressed. If a proportional character has more dot-columns than compression mask bits then the remaining dot-columns must be stored without compression. Only 39 dot-columns can be compressed. Bit 40 of the compression mask is reserved. |
| data          | Download data where each dot-column requires three bytes to define it.                                                                                                                                                                                                                                                                                                                                                                                                                          |

## ESC \ n<sub>1</sub> n<sub>2</sub>

### Prints from all characters set.

|                   |                                     |
|-------------------|-------------------------------------|
| ASCII Code        | ESC \ n <sub>1</sub> n <sub>2</sub> |
| Hexadecimal Value | 1B 5C n <sub>1</sub> n <sub>2</sub> |
| Decimal Value     | 27 92 n <sub>1</sub> n <sub>2</sub> |
| Range             | 0 ≤ n ≤ 255                         |

This escape sequence is used to print the characters "hidden" under the control codes from 1 to 1F hex and the characters from 80 to 9F hex.

The parameter n<sub>1</sub> and n<sub>2</sub> control the total number of bytes printed from the control sticks.

If n<sub>1</sub> and n<sub>2</sub> are less than the number of control codes that is desired to print, then the control codes after the count expires will be treated as control codes and will not print the "hidden" characters.

If n<sub>1</sub> and n<sub>2</sub> both equal zero the escape sequence will be ignored.

See **IBM – All Character Sets** table.

## ESC ^ n

**Prints from all characters set.**

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC ^ n             |
| Hexadecimal Value | 1B 5E n             |
| Decimal Value     | 27 94 n             |
| Range             | $0 \leq n \leq 255$ |

The next character after this escape sequence is printed even if it is "hidden" under the control codes from 1 to 1F and the characters from 80 to 9F hex.

See [IBM – All Character Sets](#) table.

## ESC[ T n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>

**Selects Code Page or ISO Code tables.**

|                   |                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC[ T n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub>   |
| Hexadecimal Value | 1B 5B 54 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> |
| Decimal Value     | 27 91 84 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> |
| Range             | $0 \leq n \leq 255$                                                                                |

Selects code page and/or ISO code table. See the following table:

|                               |                                                                                 |             |  |
|-------------------------------|---------------------------------------------------------------------------------|-------------|--|
| n <sub>2</sub>                | Number of parameter bytes that follow (n1+(n2*256))                             |             |  |
| m <sub>1</sub>                | m <sub>2</sub>                                                                  | must be 00H |  |
| m <sub>3</sub> m <sub>4</sub> | Code page number = (m <sub>3</sub> *(m <sub>4</sub> *256)) except for ISO table |             |  |
| 00 00                         | No change from current setting                                                  |             |  |
| 01 B5                         | Code page 437                                                                   | MSCP 437    |  |
| 03 52                         | Code page 850                                                                   | MSCP 850    |  |
| 03 53                         | Code page 851                                                                   | EPCP 851    |  |
| 03 54                         | Code page 852                                                                   | MSCP 852    |  |

|       |                                                            |                                                      |
|-------|------------------------------------------------------------|------------------------------------------------------|
| 03 55 | Code page 853                                              | EPCP 853                                             |
| 03 57 | Code page 855                                              | MSCP 855                                             |
| 03 5A | Code page 858                                              | Euro PC Multilingual ( <i>Euro symbol included</i> ) |
| 03 5C | Code page 860                                              | MSCP 860                                             |
| 03 5F | Code page 863                                              | MSCP 863                                             |
| 03 60 | Code page 864                                              | EPCP 864                                             |
| 03 61 | Code page 865                                              | MSCP 865                                             |
| 03 62 | Code page 866                                              | MSCP 866                                             |
| 03 63 | Code page 867                                              | EPCP 867                                             |
| 21 80 | Mazowia (Polish)                                           |                                                      |
| 21 81 | Turkish                                                    |                                                      |
| 21 82 | Greek                                                      |                                                      |
| 21 83 | Kamenicky                                                  |                                                      |
| 21 84 | CWI                                                        |                                                      |
| 21 85 | Roman-8                                                    |                                                      |
| 21 86 | IN2                                                        |                                                      |
| 21 87 | Code page 864E                                             |                                                      |
| 21 8F | ISO 8859-1 WESTERN EUROPE                                  |                                                      |
| 21 90 | ISO 8859-2 EASTERN EUROPE                                  |                                                      |
| 21 91 | ISO 8859-3 SOUTHERN EUROPE                                 |                                                      |
| 21 92 | ISO 8859-4 NORTHERN EUROPE                                 |                                                      |
| 21 93 | ISO 8859-5 CYRILLIC                                        |                                                      |
| 21 94 | ISO 8859-6 ARABIC                                          |                                                      |
| 21 95 | ISO 8859-7 GREEK                                           |                                                      |
| 21 96 | ISO 8859-8 HEBREW                                          |                                                      |
| 21 97 | ISO 8859-9 WESTERN EUROPE 2                                |                                                      |
| 17 1B | ISO 8859-15 WESTERN EUROPE ( <i>Euro symbol included</i> ) |                                                      |

MSCP = MICROSOFT CODE PAGE; EPCP = EPSON CODE PAGE

See **Character Code Tables** (for Code Page and ISO Code Pages).

## ESC k n

### Selects LQ font.

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC k n  |
| Hexadecimal Value | 1B 6B n  |
| Decimal Value     | 27 107 n |

This command selects either the resident font or font card fonts based on the value of n.

This command will also accommodate fonts in the Optional CG chip.

| <b>n</b> | <b>FONTS</b>          |
|----------|-----------------------|
| 0        | Roman (font card)     |
| 1        | Gothic                |
| 2        | Courier               |
| 3        | Prestige              |
| 4        | Script                |
| 5        | OCR-B                 |
| 6        | OCR-A                 |
| 7        | Orator                |
| 8        | Presentor (font card) |
| 9        | Script C (font card)  |
| 10H      | Option font 1         |
| 11H      | Option font 2         |
| 12H      | Option font 3         |
| 13H      | Option font 4         |

If a font card font or an Option font is not found, then the Courier resident font will be selected. If in draft mode at the time the command is received, the style will be used on the next selection of LQ mode.

## ESC I n

### Font selection (print mode).

|                   |         |
|-------------------|---------|
| ASCII Code        | ESC I n |
| Hexadecimal Value | 1B 49 n |
| Decimal Value     | 27 73 n |

This escape sequence is used to mix printing with internal fonts and with downloaded fonts.

(See [ESC =](#) for information on font downloading).

This escape sequence will override the selection of print mode from the operator panel. The allowed parameters have the following definitions:

| <b>n</b> | <b>DEFINITION</b>                                      |
|----------|--------------------------------------------------------|
| 0        | Draft at 10 cpi                                        |
| 2        | LQ at 10 cpi                                           |
| 3        | Proportional LQ                                        |
| 4        | Draft Download at 10 cpi                               |
| 6        | LQ Download at 10 cpi                                  |
| 7        | Proportional LQ Download                               |
| 8        | Draft at 12 cpi                                        |
| 10       | LQ at 12 cpi                                           |
| 12       | Draft Download at 12 cpi                               |
| 14       | LQ Download at 12 cpi                                  |
| 16       | Draft at 17 cpi (derived from 10 cpi draft)            |
| 18       | LQ at 17 cpi (derived from 10 cpi LQ)                  |
| 20       | Draft at 17 cpi (derived from downloaded 10 cpi draft) |
| 22       | LQ at 17 cpi (derived from downloaded 10 cpi LQ)       |

---

## ESC x n

### Selects print mode.

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC x n  |
| Hexadecimal Value | 1B 78 n  |
| Decimal Value     | 27 120 n |

This command selects various print modes, see the table below:

| <b>n</b> | <b>PRINT MODE</b> |
|----------|-------------------|
| 0        | Draft             |
| 1        | Letter Quality    |

---

## ESC [ I n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub> m<sub>5</sub>

### Selects font.

|                   |                                                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC [ I n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> m <sub>5</sub>  |
| Hexadecimal Value | 1B 5B 49 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> m <sub>5</sub> |
| Decimal Value     | 27 91 73 n <sub>1</sub> n <sub>2</sub> m <sub>1</sub> m <sub>2</sub> m <sub>3</sub> m <sub>4</sub> m <sub>5</sub> |
| Range             | 0 ≤ n ≤ 255                                                                                                       |

Escape sequence changes the font style and the print mode is in LQ.

See the tables in the following page:

|       |       |                                                           |
|-------|-------|-----------------------------------------------------------|
| $n_1$ | $n_2$ | number of parameter bytes that follow ( $n_1+(n_2*256)$ ) |
|-------|-------|-----------------------------------------------------------|

| $m_1$ | $m_2$ | <b>font id (<math>n_1+(n_2*256)</math>)</b> |
|-------|-------|---------------------------------------------|
| 00    | 0B    | Courier                                     |
| 00    | 55    | Courier                                     |
| 00    | FF    | Gothic                                      |
| 00    | 0C    | Prestige                                    |
| 00    | 0D    | Roman (font card)                           |
| 00    | 0E    | Script                                      |
| 00    | 0F    | OCR A                                       |
| 00    | 10    | OCR B                                       |
| 00    | 11    | Orator                                      |
| 00    | 12    | Presentor (font card)                       |
| 00    | 13    | Script C (font card)                        |

| $m_3$ | $m_4$ | <b>font width (<math>m_3+(m_4*256)/1440</math>)</b> |
|-------|-------|-----------------------------------------------------|
| 00    | 00    | No change from current setting                      |
| 00    | 54    | 17 cpi                                              |
| 00    | 60    | 15 cpi                                              |
| 00    | 78    | 12 cpi                                              |
| 00    | 90    | 10 cpi                                              |

| $m_5$ | <b>spacing attribute</b>                     |
|-------|----------------------------------------------|
| 0     | No change from current setting               |
| 1     | Change to fixed pitch indicated by $m_3 m_4$ |
| 2     | Change to proportional spacing               |

## Dot Graphics

---

### ESC K $n_1$ $n_2$ $p_1... p_x$

#### Single-density graphics ON.

|                   |                                |
|-------------------|--------------------------------|
| ASCII Code        | ESC K $n_1$ $n_2$ $p_1... p_x$ |
| Hexadecimal Value | 1B 4B $n_1$ $n_2$ $p_1... p_x$ |
| Decimal Value     | 27 75 $n_1$ $n_2$ $p_1... p_x$ |
| Range             | $n_1$ : 0-255<br>$n_2$ : 0-3   |

This is a terminator code and, when received, causes the current content of the print buffer to be printed out, then selects dot graphics at normal density, which allows printing of 60 horizontal dots per inch. Dot graphics text may also be mixed with text data on the same line.

After printing data, the printer goes back to Draft or Quality printing, according to the selection made before.

- Parameter  $n_1$  &  $n_2$  specify the number of columns of dot graphics.
- Parameter  $p_1... p_x$  specify which dots in each column are to be printed.

If your graphics pattern has fewer than 256 columns, then  $n_1$  is equal to number of columns and  $n_2$  is equal to 0. If your graphics pattern has more than 256 columns, then  $n_1$  is equal to remainder of the number of columns divided by 256 and  $n_2$  is equal to integer result of the number of columns divided by 256.

The data that will exceed the position of the right margin is discarded.

To calculate from  $p_1$  to  $p_x$ , assign the value of each bit for each column:

| BIT | VALUE |                                                                                                                                                                                                                |
|-----|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7   | 128   | Add up the numbers corresponding to the dots that you want in each column. For example: if you want a dot in the 7 <sup>th</sup> , 4 <sup>th</sup> and 1 <sup>st</sup> pins, the count is $146 = 128 + 16 + 2$ |
| 6   | 64    |                                                                                                                                                                                                                |
| 5   | 32    |                                                                                                                                                                                                                |
| 4   | 16    |                                                                                                                                                                                                                |
| 3   | 8     |                                                                                                                                                                                                                |
| 2   | 4     |                                                                                                                                                                                                                |
| 1   | 2     |                                                                                                                                                                                                                |
| 0   | 1     |                                                                                                                                                                                                                |

These numbers replace the parameter  $p_1$  to  $p_x$  in the escape sequence, where  $p_1$  is the number corresponding to the first column of the graphics pattern and  $p_x$  refers to the last column.

Eight bits are expanded to 24 dot data.

If the IBM Proprinter XL24 is selected in the *System Menu*, (check, under EMULATION, that the EMUL:IBMXL24e function is selected, please refer to the *User's Manual* on the CD-Rom), 20 pins from 24 pins of the print head simulate 8 dot data:

| 8 BITS IN 1 BYTE |                |          |
|------------------|----------------|----------|
| BYTE             | PRINT HEAD PIN | DATA BIT |
| 1                | 1              | 7        |
|                  | 2              | 7        |
|                  | 3              | 7&6      |
|                  | 4              | 6        |
|                  | 5              | 6        |
|                  | 6              | 5        |
|                  | 7              | 5        |
|                  | 8              | 5&4      |
|                  | 9              | 4        |
|                  | 10             | 4        |
|                  | 11             | 3        |
|                  | 12             | 3        |
|                  | 13             | 3&2      |
|                  | 14             | 2        |
|                  | 15             | 2        |
|                  | 16             | 1        |
|                  | 17             | 1        |
|                  | 18             | 1&0      |
|                  | 19             | 0        |
|                  | 20             | 0        |

---

## ESC L $n_1$ $n_2$ $p_1$ ... $p_x$

### Double-density graphics ON.

|                   |                                   |
|-------------------|-----------------------------------|
| ASCII Code        | ESC L $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Hexadecimal Value | 1B 4C $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Decimal Value     | 27 76 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Range             | $n_1$ : 0-255<br>$n_2$ : 0-6      |

This code is a terminator code and therefore causes the current contents of the print buffer to be printed out, then sets double density, half speed graphics printing, which allows the printing of 120 horizontal dots per inch. For more detailed information, see the description of [ESC K](#) command.

---

## ESC Y $n_1$ $n_2$ $p_1$ ... $p_x$

### Double-density graphics ON.

|                   |                                   |
|-------------------|-----------------------------------|
| ASCII Code        | ESC Y $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Hexadecimal Value | 1B 59 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Decimal Value     | 27 42 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Range             | $n_1$ : 0-255<br>$n_2$ : 0-6      |

This code is a terminator code and therefore causes the current contents of the print buffer to be printed out, then sets double density, normal speed graphics printing, which allows the printing of 120 horizontal dots per inch. For more detailed information, see the description of [ESC K](#) command.

---

## ESC Z $n_1$ $n_2$ $p_1$ ... $p_x$

### Quadruple-density graphics ON.

|                   |                                   |
|-------------------|-----------------------------------|
| ASCII Code        | ESC Z $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Hexadecimal Value | 1B 5A $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Decimal Value     | 27 90 $n_1$ $n_2$ $p_1$ ... $p_x$ |
| Range             | $n_1$ : 0-255;<br>$n_2$ : 0-12    |

This code is a terminator code and therefore causes the current contents of the print buffer to be printed out, then sets quadruple density, half speed graphics printing, which allows the printing of 240 horizontal dots per inch. See the [ESC K](#) command description.

---

## ESC \* $m$ $n_1$ $n_2$ $p_1$ $p_2$ ... $p_x$

### Selects bit image mode.

|                   |                                                                                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC * $m$ $n_1$ $n_2$ $p_1$ $p_2$ ... $p_x$                                                                         |
| Hexadecimal Value | 1B 2A $m$ $n_1$ $n_2$ $p_1$ $p_2$ ... $p_x$                                                                         |
| Decimal Value     | 27 42 $m$ $n_1$ $n_2$ $p_1$ $p_2$ ... $p_x$                                                                         |
| Range             | $m = 0, 1, 2, 3, 4, 6, 7, 8, 32, 33, 34, 35, 36, 38, 39, 40$<br>$0 \leq n_1, n_2 \leq 255$<br>$0 \leq p_x \leq 255$ |

If the IBM Proprinter XL24 is selected in the *System Menu*, (check, under EMULATION, that the EMUL: IBMXL24e function is selected, please refer to the *User's Manual* on the CD-Rom), you can select 8-wire or 24-wire bit image mode.

The parameter  $m$  determines the horizontal density as well as the number of wires to be fired.

- For 8-wire images, the total number of data bytes ( $p_x$ ) to be sent is determined by the following formula:  $n_1 + (n_2 \times 256)$ .
- For 24-wire images, the total number is determined by  $3 \times (n_1 + (n_2 \times 256))$ .

| <b>m</b> | <b>DPI</b> | <b># WIRES</b> | <b>DENSITY NAME</b> |
|----------|------------|----------------|---------------------|
| 0        | 60         | 8              | Single              |
| 1        | 120        | 8              | Double              |
| 2        | 120        | 8              | Double (high-speed) |
| 3        | 240        | 8              | Quadruple           |
| 4        | 80         | 8              | CRT Graphic I       |
| 6        | 90         | 8              | CRT Graphic II      |
| 7        | 180        | 8              | Triple              |
| 8        | 360        | 8              | Hex                 |
| 32       | 60         | 24             | Single              |
| 33       | 120        | 24             | Double              |
| 34       | 120        | 24             | Double (high-speed) |
| 35       | 240        | 24             | Quadruple           |
| 36       | 80         | 24             | CRT Graphic I       |
| 38       | 90         | 24             | CRT Graphic II      |
| 39       | 180        | 24             | Triple              |
| 40       | 360        | 24             | Hex                 |

## Horizontal Movements

---

### BS

#### **Backspace.**

|                   |    |
|-------------------|----|
| ASCII Code        | BS |
| Hexadecimal Value | 08 |
| Decimal Value     | 8  |

The backspace command will move the print head one character width to the left based on current cpi in effect. This means that a horizontal tab followed by a backspace will move the carriage only one character space and will not have the effect of canceling the horizontal tab.

---

### HT

#### **Horizontal tab.**

|                   |    |
|-------------------|----|
| ASCII Code        | HT |
| Hexadecimal Value | 09 |
| Decimal Value     | 9  |

This code will position the print head right to the next horizontal tab stop position. Power up default is to have a tab in the ninth character position and every eighth position thereafter, unless tabs are previously set by host and stored in NVRAM.

Up to 28 horizontal tabs may be set by the **ESC D** command.

---

## ESC D $n_1 n_2 \dots n_k$ NUL

### Sets horizontal tab stops.

|                   |                               |
|-------------------|-------------------------------|
| ASCII Code        | ESC D $n_1 n_2 \dots n_k$ NUL |
| Hexadecimal Value | 1B 44 $n_1 n_2 \dots n_k$ NUL |
| Decimal Value     | 27 68 $n_1 n_2 \dots n_k$ NUL |

Sets horizontal tab stops in columns as indicated by parameters. There can be a maximum of 28 tab stops at any given time. The parameters must come in ascending order. The list of tab stops must be terminated by the NUL code. Parameters are column numbers at which tab stops are to be set.

Any column that is not referenced in the list is cleared by this command. Therefore using this sequence without any parameters will clear all horizontal tab stops.

The default tab setting from power up is a tab set in column nine and every eight columns thereafter, unless tabs are previously set by host and stored in NVRAM. ESC D NUL will clear all horizontal tab settings. If more than 28 tabs are sent to be set, the 28<sup>th</sup> tab setting automatically causes an exit from the tabs set mode and subsequent data is interpreted as normal text data.

Any parameter that found in descending order would be ignored. Transition from one character pitch to another (e.g. 10 to 12 cpi) will result in tab stops that are in the ninth column as indicated by the ESC D sequence parameters.

---

## ESC X $n_1 n_2$

### Sets horizontal margin.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC X $n_1 n_2$     |
| Hexadecimal Value | 1B 58 $n_1 n_2$     |
| Decimal Value     | 27 88 $n_1 n_2$     |
| Range             | $0 \leq n \leq 255$ |

Sets left ( $n_1$ ) and right ( $n_2$ ) margin positions. Units of  $n$  are the character spacing increment when the command is received. The parameter  $n_1$  and  $n_2$  are eight bit binary coded values. The current pitch setting is used so margins set by ESC X 10 50 would not be the same positions on the page if set in normal or compressed mode. Send a CR immediately after this escape sequence in order to position the print head at the new left margin. Margin settings are stored as absolute distances from the physical left print limit; therefore, they will not change if it is chosen double wide or compressed print.

An automatic LF and CR will occur at the right margin (AUTO WRAP function enabled: see in the *System Menu*, under OTHER OPTIONS, the OPT:AUTO WRAP function selected with the OPT:AUTO WRAP>Y value , please refer to the *User's Manual* on the CD-Rom).

---

## ESC R

### Sets tabs to default setting.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC R |
| Hexadecimal Value | 1B 52 |
| Decimal Value     | 27 82 |

It resets all horizontal tabs to every eighth character spacing beginning with character space nine. It cancels vertical tabs.

---

## CR

### Carriage return.

|                   |    |
|-------------------|----|
| ASCII Code        | CR |
| Hexadecimal Value | OD |
| Decimal Value     | 13 |

The carriage return will position the print head to the left margin for subsequent printable data to be printed. This code is a line terminator.

A LF is executed based upon the AUTO LF selection (see in the *System Menu*, under OTHER OPTIONS, the OPT:AUTO LF function (OPT:AUTO LF>Y), please refer to the *User's Manual* on the CD-Rom) or upon the **ESC 5** command.

If the parallel interface signal AFXT, pin 14 selected in the *System Menu*, (see in the *System Menu*, under PARALLEL OPTIONS, the PAR:AFXT function (PAR:AFXT>Y), please refer to the *User's Manual* on the CD-Rom) is found to be at a logic 0 condition when a CR is received, then a line feed will occur.

---

## ESC d $n_1 n_2$

### Relative move in-line forward.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC d $n_1 n_2$     |
| Hexadecimal Value | 1B 64 $n_1 n_2$     |
| Decimal Value     | 27 100 $n_1 n_2$    |
| Range             | $0 \leq n \leq 255$ |

It causes the print position to move to the right by  $(n_1 + (n_2 * 256)) / 120$  inch. If the value exceeds the right margin, then the actual distance move will be to the right margin. In-line move space is underlined or overscored if these modes are enabled. It is valid in all print modes.

## Vertical Movements

---

### LF

#### **Line feed.**

|                   |    |
|-------------------|----|
| ASCII Code        | LF |
| Hexadecimal Value | 0A |
| Decimal Value     | 10 |

Position the paper down one line space as indicated by the current value of the line spacing increment. This code is a line terminator. This code will terminate the double-width-printing mode initiated by a received SO code.

If the positioning causes the next line to exceed the form length, then the print head will move to the next top of form position.

---

### ESC 4

#### **Set top of form.**

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 4 |
| Hexadecimal Value | 1B 34 |
| Decimal Value     | 27 52 |

Sets the top of form at the current print line position. Vertical tab settings and perforation skip length are not affected by this command.

---

## ESC 5 n

### Automatic line feed.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC 5 n             |
| Hexadecimal Value | 1B 35 n             |
| Decimal Value     | 27 53 n             |
| Range             | $0 \leq n \leq 255$ |

When n is odd, the printer will execute an automatic linefeed upon processing a received CR. This escape sequence takes precedence over AUTO LF function (see in the *System Menu*, under OTHER OPTIONS, the OPT:AUTO LF function, please refer to the *User's Manual* on the CD-Rom).

---

## FF

### Form feed.

|                   |    |
|-------------------|----|
| ASCII Code        | FF |
| Hexadecimal Value | 0C |
| Decimal Value     | 12 |

The form feed command will position the print head to the top of the next form at the left margin. This code is a line terminator.

---

## VT

### Vertical tab.

|                   |    |
|-------------------|----|
| ASCII Code        | VT |
| Hexadecimal Value | 0B |
| Decimal Value     | 11 |

The vertical tab command advances the paper vertically to the next preprogrammed vertical tab position. Maximums of 64 vertical tab positions are allowed per form. A CR is executed based upon the AUTO CR function (see in the *System Menu*, under IBM OPTIONS, the IBM:AUTO CR function, please refer to the *User's Manual* on the CD-Rom).

This code is a line terminator.

If no tab is set beyond the current line, a vertical tab will position the paper down one line spacing. When a vertical tab would cause the printer to exceed the current form length (taking into account any perforation skip distance) the vertical tab will act as a linefeed.

If no tab has been set by **ESC B** command, then VT will act as a linefeed. Tabs previously set by host and stored in NVRAM will be recalled upon power up.

---

## ESC B $n_1$ $n_2$ ... $n_k$ NUL

### Vertical tabs.

|                   |                                           |
|-------------------|-------------------------------------------|
| ASCII Code        | ESC B $n_1$ $n_2$ ... $n_k$ NUL           |
| Hexadecimal Value | 1B 42 $n_1$ $n_2$ ... $n_k$ NUL           |
| Decimal Value     | 27 66 $n_1$ $n_2$ ... $n_k$ NUL           |
| Range             | $1 \leq n \leq 255$<br>$1 \leq n \leq 16$ |

Sets vertical tab stops as indicated by parameters. The parameters are line numbers at the current line spacing when tab stops are to be executed. The list of tab stops must be terminated by the NUL code.

Tab stops are defined as line numbers at the current line spacing. Any line that is not referenced in the list is cleared by this command. Therefore using this sequence without any parameters will clear all vertical tab stops.

There can be a maximum of 64 tab stops at any given time. The parameters must come in ascending order. Tabs stops are indications of the printable position that the character printed after moving to that tab.

If a tab is set at line 8, a tab and print will print the character in the eighth line. The vertical tabs must be established by the user, as there are no vertical tabs set when the printer is turned on, unless tabs previously set by host and stored in NVRAM.

---

## ESC J n

### Single variable line feed.

|                   |                     |
|-------------------|---------------------|
| ASCII Code        | ESC J n             |
| Hexadecimal Value | 1B 4A n             |
| Decimal Value     | 27 74 n             |
| Range             | $0 \leq n \leq 255$ |

The print position will be moved down the page in increments of

- $n/180''$ , if AGM disabled or VSU setting = 1/180
- $n/216''$ , if AGM enabled or VSU setting = 1/216

If CR following LF is enabled by menu (see in the *System Menu*, under IBM OPTIONS, the IBM:AUTO CR function, please refer to the *User's Manual* on the CD-Rom) then carriage return will also occur. It is a valid parameter value that will produce no vertical motion but will still move the print head position to the left margin (if enabled by menu selection).

## Miscellaneous

---

### ESC

**Escape (control sequence introducer).**

|                   |     |
|-------------------|-----|
| ASCII Code        | ESC |
| Hexadecimal Value | 1B  |
| Decimal Value     | 27  |

This code is used as a control sequence introducer. It implies that subsequent code(s) will define a given action of the printer.

---

### ESC EM n

**Auto Sheet Feeder (ASF) & Paper Path Control.**

|                   |          |
|-------------------|----------|
| ASCII Code        | ESC EM n |
| Hexadecimal Value | 1B 19 n  |
| Decimal Value     | 27 115 n |

Controls optional ASF and other Paper paths for paper parking, loading and ejecting.

|                                                |
|------------------------------------------------|
| <b>The ASF must be installed and selected.</b> |
|------------------------------------------------|

This command supersedes operator panel selection of paper paths.

| <b>n</b> | <b>PAPER PATH CONTROL</b>                                                                                                                                                 |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0        | Reserved                                                                                                                                                                  |
| 1        | Selects Bin 1 for use after ejecting current sheet                                                                                                                        |
| 2        | Selects Bin 2 for use after ejecting current sheet                                                                                                                        |
| 3        | Selects Bin 3 for use after ejecting current sheet                                                                                                                        |
| 4        | Enables ASF, printer online                                                                                                                                               |
| C        | Selects and loads from Bin1, then loads from Bin 2 thereafter                                                                                                             |
| R        | Ejects paper without loading another sheet. Printer will remain Online indicating Paper in condition. Incoming data will cause sheet to load from currently selected bin. |
| 8        | Parks current path. The maximum reverse distance is one form length for continuous forms. The current sheet is ejected for ASF cut sheet forms. See NOTE below.           |
| 9        | Loads currently selected path. See NOTE below.                                                                                                                            |
| 10       | Selects and loads Front2 path (continuous forms). The current paper path will park or eject and the Front2 path is loaded. (Same as n = 13).                              |
| 11       | Selects and loads Front1 path (continuous forms). The current paper path will park or eject and the Front1 path is loaded. (Same as n = 12).                              |
| 12       | Selects and loads Front1 path (continuous forms). The current paper path will park or eject and the Front1 path is loaded. (Same as n = 11).                              |
| 13       | Selects and loads Front2 path (continuous forms). The current paper path will park or eject and the Front2 path is loaded. (Same as n = 10).                              |
| 14       | Reserved                                                                                                                                                                  |
| 15       | Selects ASF bin 1. The current path will park and ASF bin 1 is loaded.                                                                                                    |
| 16       | Selects ASF bin 2. The current path will park and ASF bin 2 is loaded.                                                                                                    |
| 17       | Selects ASF bin 3. The current path will park and ASF bin 3 is loaded.                                                                                                    |

**Values of n = 1 ,2,3,C, R, are ignored if the ASF PATH has not been selected via n = 15, 16,17 or from the operator panel.**

## NOTE:

- Between the time a form/page is parked/ejected and the next path is loaded, the interface will indicate a paper out condition. However, during loading from Front1 path or Front2 path or ASF path, if a paper out condition is detected, then the interface will indicate paper out.
- Selection of the Push-Pull path (if in the *System Menu*, the PATH:TRACTOR function, under PATH OPTIONS, is selected PATH:TRACT>PSHPL value, please refer to the *User's Manual* on the CD-Rom) will prevent selection of the Front1, Front2 or ASF paths by this command.
- If CONFIRM PARK is selected (if in the *System Menu*, the OPT:CONFIRM PARK function, under OTHER OPTIONS, is selected OPT:CNFRM PARK>Y value, please refer to the *User's Manual* on the CD-Rom) then prior to park current path, the paper will move to the tear-off position and the LCD will display: PLEASE TEAR OFF. Push the TEAR key or PARK/PATH key to enable subsequent parking of the form.
- If CONFIRM PARK is not selected (if in the *System Menu*, the OPT:CONFIRM PARK function, under OTHER OPTIONS, is selected OPT:CNFRM PARK>N value, please refer to the *User's Manual* on the CD-Rom) then parking will be attempted without your intervention.

---

## BEL

### Sounds the buzzer.

|                   |     |
|-------------------|-----|
| ASCII Code        | BEL |
| Hexadecimal Value | 07  |
| Decimal Value     | 7   |

The printer's buzzer is sounded for approximately 0.5 second. If a series of bell codes is sent to the printer successively then the result will be a continuous buzzing sound approximately the number of seconds long corresponding to the number of bell codes sent. It is required that other printer operations do not cease while the bell is sounding. Bell response can be modified by menu (see in the *System Menu*, under OTHER OPTIONS, the OPT: BELL ENABLE function (OPT:BELL ENBL>Y/OPT:BELL ENBL>N), please refer to *User's Manual* on the CD-Rom)

---

## SP

### Space character.

|                   |    |
|-------------------|----|
| ASCII Code        | SP |
| Hexadecimal Value | 20 |
| Decimal Value     | 32 |

The space character will position the print head one character space to the right in normal character printing mode.

---

## CAN

### Cancels data.

|                   |     |
|-------------------|-----|
| ASCII Code        | CAN |
| Hexadecimal Value | 18  |
| Decimal Value     | 24  |

This code will cause all printable data received since the last line terminator to be deleted. This code is a line terminator. The current print position will be retained. Printer response to this code is enabled/disabled by the CAN CODE selection (see in the *System Menu*, under OTHER OPTIONS, the OPT:CAN CODE function (OPT:CAN CODE>Y/OPT:CAN CODE>N), please refer to *User's Manual* on the CD-Rom)

---

## ESC [ K n<sub>1</sub> n<sub>2</sub> init ID m<sub>1</sub> m<sub>2</sub>

### Printer setup.

|                   |                                                                              |
|-------------------|------------------------------------------------------------------------------|
| ASCII Code        | ESC [ K n <sub>1</sub> n <sub>2</sub> init ID m <sub>1</sub> m <sub>2</sub>  |
| Hexadecimal Value | 1B 5B 4B n <sub>1</sub> n <sub>2</sub> init ID m <sub>1</sub> m <sub>2</sub> |
| Decimal Value     | 27 91 75 n <sub>1</sub> n <sub>2</sub> init ID m <sub>1</sub> m <sub>2</sub> |
| Range             | 0 ≤ n ≤ 255                                                                  |

This escape sequence causes the printer to reset to its initial state according to the parameters.

If the user specifies a value of 0, 1 or 254 and parameters are specified, the parameter overwrites the current menu setting.

If the user specifies a value of 4, 5 or 255 and parameters are specified, the parameter overwrites the printer function setting set by the factory.

|               |                                                                                                                                                                                                                                                                                 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $n_1 n_2$ :   | Number of parameter bytes that follow ( $n_1 + (n_2 * 256)$ )                                                                                                                                                                                                                   |
| <u>init</u> : | Specifies reset condition: (init values that are not supported are recognized as 00).                                                                                                                                                                                           |
| 00H           | The printer is initialized to the user default setting. The downloaded font is not cleared. If the user specifies parameters, they overwrite current <i>Operational Menu</i> setting.                                                                                           |
| 01H           | The printer is initialized to the user default setting. The downloaded font is cleared. The code page is initialized as set by System Menu value. If the user specifies parameters, they overwrite current <i>Operational Menu</i> setting.                                     |
| 04H           | The printer is initialized to the factory default setting. The downloaded font is not cleared. If the user specifies parameters, they overwrite factory (IBM) <i>Operational Menu</i> setting. The code page is initialized as set by ISU value. 10 cpi draft font is selected. |
| 05H           | The printer is initialized to the factory default setting. The downloaded font is cleared. The code page is initialized as set by ISU value. If the user specifies parameters, they overwrite the factory (IBM) <i>Operational Menu</i> setting. 10 cpi draft font is selected. |
| FEH           | When the user specifies this value, the printer performs the same function as 01H and the parameters that follow are saved in Non-volatile memory (EEPROM) as updated user default settings.                                                                                    |
| FFH           | When the user specifies this value, the printer performs the same function as 05H and the parameters that follow are saved in NVM memory as updated user default settings.                                                                                                      |
| ID            | Specifies the printer.                                                                                                                                                                                                                                                          |
| 23H24H        | Command honored and acted upon according to init, $m_1$ , $m_2$ .                                                                                                                                                                                                               |

m<sub>1</sub>: Specifies which *Operational Menu* setting is ON or OFF as follows:

| BIT | ITEMS        | OFF (=0)                   | ON (=1)                 |
|-----|--------------|----------------------------|-------------------------|
| 7   | Discard byte | Process this byte          | Ignore this byte        |
| 6   | Reserved     |                            |                         |
| 5   | Alarm        | Enables alarm              | Disables alarm          |
| 4   | Auto CR      | No CR on vertical movement | CR on vertical movement |
| 3   | Auto LF      | NO LF with CR              | Auto LF with CR         |
| 2   | Form length  | 11" form length            | 12" form length         |
| 1   | Zero slash   | Normal zero                | Slashed zero            |
| 0   | Char set     | CS1                        | CS2                     |

m<sub>2</sub>: Specifies which *Operational Menu* setting is ON or OFF as follows:

| BIT | ITEMS        | OFF (=0)                 | ON (=1)              |
|-----|--------------|--------------------------|----------------------|
| 7   | Discard byte | Process this byte        | Ignore this byte     |
| 6   | Selects CG   | Selects USA National set | Selects Multilingual |
| 5   | Reserved     |                          |                      |
| 4   | Reserved     |                          |                      |
| 3   | Reserved     |                          |                      |
| 2   | Reserved     |                          |                      |
| 1   | Line length  | 13.6"                    | 8"                   |

---

## DC1

### Selects printer or XON.

|                   |     |
|-------------------|-----|
| ASCII Code        | DC1 |
| Hexadecimal Value | 11  |
| Decimal Value     | 17  |

In the parallel interface mode, after the printer has been de-selected by ESC Q 23 or 24, this control code will set the parallel interface signals SLCT to a logic one condition and enable the printer to resume printing.

When in the serial interface mode, this code is sent from the printer to the host to indicate that the printer is ready to receive data (XON), caused by any of the following conditions: Input buffer empty, or Offline - Online from control panel after printer error conditions are cleared.

---

## NUL

### NUL.

|                   |     |
|-------------------|-----|
| ASCII Code        | NUL |
| Hexadecimal Value | 00  |
| Decimal Value     | 0   |

This code does not have an action associated with it when by it. It is used by other sequences (ex. ESC B) to terminate an action such as a list of parameters. It can also serve as a valid parameter in certain escape sequences (i.e. ESC S NUL would cause superscripting to occur).

It may also be used to indicate that no wires be fired in a column of dot graphics mode.

---

## ETX

### End of transmission.

|                   |     |
|-------------------|-----|
| ASCII Code        | ETX |
| Hexadecimal Value | 03  |
| Decimal Value     | 3   |

This code is used in conjunction with ACK for the ETX/ACK protocol. This protocol is enabled/disabled in the *System Menu* (see in the *System Menu*, under SERIAL OPTIONS, the SER:ETX/ACK function (SER:ETX/ACK>Y, SER:ETX/ACK>N), please refer to the *User's Manual* on the CD-Rom). The host transmits a block of characters followed by an ETX character. The host should transmit no more characters until it receives an ACK character from the printer. However, the host may choose to transmit multiple blocks of data terminated with ETX even though the printer has not transmitted ACK. The data source is responsible for ensuring that it does not transmit a string of data that exceeds the capacity of the printer's receive buffer.

---

## ACK

### Acknowledge.

|                   |     |
|-------------------|-----|
| ASCII Code        | ACK |
| Hexadecimal Value | 06  |
| Decimal Value     | 6   |

This code is used in conjunction with ETX for the ETX/ACK protocol. This protocol is enabled/disabled in *System Menu* (see in the *System Menu*, under SERIAL OPTIONS, the SER:ETX/ACK function (SER:ETX/ACK>Y, SER:ETX/ACK>N), please refer to the *User's Manual* on the CD-Rom). The printer will transmit ACK at the currently selected baud rate and bit/parity selection. Transmission of the ACK is delayed until an ETX has been removed in the input buffer. An ACK will be transmitted for each ETX received even if there are multiple ETX in the buffer. Throughput may be reduced when this protocol is enabled. Does not affect function of DC1/DC3 protocol. Not valid in parallel interface protocol.

---

## ESC U n

### Unidirectional print ON/OFF.

|                   |                               |
|-------------------|-------------------------------|
| ASCII Code        | ESC U n                       |
| Hexadecimal Value | 1B 55 n                       |
| Decimal Value     | 27 85 n                       |
| Range             | $0 \leq n \leq 255$ (decimal) |

Causes printing to occur from left to right only. If n is 01H, then unidirectional printing is activated. The escape sequence to print unidirectional will take effect at the point in the line where the escape is. Characters before the escape sequence may be printed left to right only. If n is 00H, then unidirectional printing is canceled. The escape sequence to cancel should be the first thing in a line to be printed bi-directional. If both the command to start and stop unidirectional print are in the same line the printer will act on the last one received.

---

## ESC Q n

### Deselects printer.

|                   |                            |
|-------------------|----------------------------|
| ASCII Code        | ESC Q n                    |
| Hexadecimal Value | 1B 51 n                    |
| Decimal Value     | 27 81 n                    |
| Range             | n = 23, 24 (35,36 decimal) |

When this escape sequence is sent to the printer, the printer will set the parallel interface signals SLCT to a logical zero condition and disable printing of received data. In the serial interface mode, this sequence causes the printer to disable printing of received data. Printing can be resumed by resetting the printer or sending DC1 to the printer or depressing the ON LINE key on the operator panel twice.

Indeterminate Conditions: If the third byte is not hex 23 or 24, the escape sequence is ignored.

---

## DC3

### XOFF.

|                   |     |
|-------------------|-----|
| ASCII Code        | DC3 |
| Hexadecimal Value | 13  |
| Decimal Value     | 19  |

In the serial interface, this code is sent from the printer to the host to indicate that it is not ready to receive data (XOFF).

It may be caused by any one of the following conditions:

- 1) Input buffer full
- 2) Online-Offline from operator panel
- 3) Online-Offline due to printer error condition
  - a) Out of paper
  - b) Carriage Error
  - c) Other printer error conditions

In the serial and parallel mode, a received DC3 is ignored.

---

## ESC j

### Stops printing.

|                   |        |
|-------------------|--------|
| ASCII Code        | ESC j  |
| Hexadecimal Value | 1B 6A  |
| Decimal Value     | 27 106 |

Used primarily for diagnostic purposes, this command causes the printer to print the data remaining in the print buffer, sound the audible alarm and go offline.

Additionally, the ON LINE led should blink on and off continuously. Depressing the ON LINE key will put the printer back on-line.

---

---

## ESC 6

### Selects character set 2.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 6 |
| Hexadecimal Value | 1B 36 |
| Decimal Value     | 27 54 |

Enables character printing and disables control code execution in the range 03H-06H, 15H, 80H, 9FH.

See expanded character set (also known as [Character Set 2](#)).

---

## ESC 7

### Selects character set 1.

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC 7 |
| Hexadecimal Value | 1B 37 |
| Decimal Value     | 27 55 |

Enables control code execution and disables character printing in the range 03H-06H, 15H, 80H, 9FH.

See expanded character set (also known as [Character Set 1](#)).

---

## ESC [ p<sub>1</sub>; 2 SP ~

### Selects emulation.

|                   |                                               |
|-------------------|-----------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; <p>2</p> SP ~          |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 20 7E  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 32 126 |

This sequence will switch the emulation of the printer to another available emulation.

There are two parameters defined in the sequence which are as follows:

- p<sub>1</sub>: Emulation identifier.  
This parameter will select the particular emulation by a reference number that can be found in the description of the table.
- p<sub>2</sub>: Reset control.  
The parameters of the printer (tabs, margins, page length, etc.) to be reset or defaulted are controlled by this parameter.

See the following tables:

| p <sub>1</sub> | EMULATION                  |
|----------------|----------------------------|
| 0              | GENICOM ANSI               |
| 23             | IBM Proprinter XL24/XL 24E |
| 24             | EPSON LQ-1050              |

| p <sub>2</sub> | SWITCH CONDITION                     |
|----------------|--------------------------------------|
| 0              | Printer parameters maintained        |
| 1              | Printer parameters reset to defaults |

## Native Extension Escape Sequences

These native extension escape sequences are valid if enabled via menu (see in the *System Menu*, under OTHER OPTIONS, the OPT: NATIVE COMND function, please refer to the *User's Manual* on the CD-Rom).

---

### ESC [[ 3 n

**Sets metric line spacing.**

|                   |               |
|-------------------|---------------|
| ASCII Code        | ESC [[ 3 n    |
| Hexadecimal Value | 1B 5B 5B 33 n |
| Decimal Value     | 27 91 91 51 n |

Sets the spacing between lines as indicated by parameter n as follows:

| <b>n</b> | <b>SPACING INCREMENT</b> |
|----------|--------------------------|
| 33H      | 3 lines on 30 mm         |
| 34H      | 4 lines on 30 mm         |
| 36H      | 6 lines on 30 mm         |
| 38H      | 8 lines on 30 mm         |
| 31H      | 12 lines on 30 mm        |

This sequence overrides the current line spacing increment. Other values are ignored.

---

## ESC [[ x n

### Selects national character set.

|                   |                |
|-------------------|----------------|
| ASCII Code        | ESC [[ x n     |
| Hexadecimal Value | 1B 5B 5B 78 n  |
| Decimal Value     | 27 91 91 120 n |

Selects Epson national character set indicated by parameter n, where n is equivalent to the parameter in the Epson **ESC R** n command.

---

## ESC [[ y n<sub>1</sub> n<sub>2</sub>

### Sets IBM Code Page.

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [[ y n <sub>1</sub> n <sub>2</sub>     |
| Hexadecimal Value | 1B 5B 5B 79 n <sub>1</sub> n <sub>2</sub>  |
| Decimal Value     | 27 91 91 121 n <sub>1</sub> n <sub>2</sub> |

Selects IBM code page indicated by parameters n<sub>1</sub>, n<sub>2</sub> where n<sub>1</sub>, n<sub>2</sub> are equivalent to the parameters m<sub>3</sub>, m<sub>4</sub> in the IBM **ESC [ T** n<sub>1</sub> n<sub>2</sub> m<sub>1</sub> m<sub>2</sub> m<sub>3</sub> m<sub>4</sub>.

---

## // n //

### Embedded Sheet Feeder commands.

|                   |               |
|-------------------|---------------|
| ASCII Code        | // n //       |
| Hexadecimal Value | 2F 2F n 2F 2F |
| Decimal Value     | 47 47 n 47 47 |

Control Sheet Feeder as indicated by n as follows:

| n   | ACTION                       | n   | ACTION                                                                                       |
|-----|------------------------------|-----|----------------------------------------------------------------------------------------------|
| 31H | Selects Bin 1 for future use | 43H | Selects Bin1 for first feed, then selects Bin 2 thereafter or until a new command is issued. |
| 32H | Selects Bin 2 for future use | 52H | Ejects current sheet                                                                         |

Indeterminate Conditions: a new sheet is loaded in response to FF or at the end of form via LF, VT,

# ANSI Emulation Commands

The following printer commands are supported by this printer according to the GENICOM ANSI emulation.

**Most dimensional parameters in ANSI protocol are expressed in "decipoints". For example:**

1 decipoint = 1/720 inch  
72 decipoints = 1/10 inch  
120 decipoints = 1/6 inch  
720 decipoints = 1 inch  
2880 decipoints = 4 inches

**All parameter values must be expressed as ASCII numeric rather than binary values.**

**Parameters, within commands with multiple parameters, must be separated by a semicolon ";".**

See **BASIC Program Sample** and result printed by the printer on.

# ANSI Command Descriptions

## Character Set Control

### ESC [ p<sub>1</sub> x

**Selects national character set (Select National Characters - GENSNC).**

|                   |                          |
|-------------------|--------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> x   |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 78  |
| Decimal Value     | 27 91 p <sub>1</sub> 120 |

This command selects the national character set table according to the p<sub>1</sub> parameter value. See the following tables:

#### 7-bit Substitution

| p <sub>1</sub> | NATION             | p <sub>1</sub> | NATION                                   |
|----------------|--------------------|----------------|------------------------------------------|
| 0              | USA                | 13             | Swedish/Finnish A                        |
| 1              | Germany            | 14             | Swedish/Finnish B                        |
| 2              | French A           | 15             | Swedish/Finnish C                        |
| 3              | French B           | 16             | Swedish/Finnish D                        |
| 4              | French Canadian    | 17             | Switzerland                              |
| 5              | Netherlands        | 18             | USA (ISO)                                |
| 6              | Italian            | 19             | Yugoslavia                               |
| 7              | United Kingdom     | 20             | United Kingdom A                         |
| 8              | Spanish            | 21             | Turkey                                   |
| 9              | Danish/Norwegian A | 22             | Greece                                   |
| 10             | Danish/Norwegian B | 25             | Cyrillic                                 |
| 11             | Danish/Norwegian C | 90 to 99       | Downloaded Substitution Sets (all fonts) |
| 12             | Danish/Norwegian D |                |                                          |

See [ANSI National Variation](#) table.

## 8-bit Substitution

| <b>p<sub>1</sub></b> | <b>CHARACTER SETS</b>                   | <b>p<sub>1</sub></b> | <b>CHARACTER SETS</b>           |
|----------------------|-----------------------------------------|----------------------|---------------------------------|
| 437                  | Code Page 437                           | 8579                 | Kamenicky                       |
| 850                  | Code Page 850                           | 8580                 | CWI                             |
| 851                  | Code Page 851                           | 8581                 | Roman-8                         |
| 852                  | Code Page 852                           | 8582                 | IN2                             |
| 853                  | Code Page 853                           | 8583                 | Code Page 864E                  |
| 855                  | Code Page 855                           | 8584 to 8590         | Reserved                        |
| 858                  | Code Page 858<br>(Euro symbol included) | 8591                 | ISO 8859-1 Western Europe       |
| 860                  | Code Page 860                           | 8592                 | ISO 8859-2 Eastern Europe       |
| 863                  | Code Page 863                           | 8593                 | ISO 8859-3 Southern Europe      |
| 864                  | Code Page 864                           | 8594                 | ISO 8859-4 Northern Europe      |
| 865                  | Code Page 865                           | 8595                 | ISO 8859-5 Cyrillic             |
| 866                  | Code Page 866                           | 8596                 | ISO 8859-6 Arabic               |
| 867                  | Code Page 867                           | 8597                 | ISO 8859-7 Greek                |
| 5915                 | ISO 8859-15<br>(Euro symbol included)   | 8598                 | ISO 8859-8 Hebrew               |
| 8570 to 8575         | Reserved                                | 8599                 | ISO 8859-9 Southern Europe 2    |
| 8576                 | Mazowia                                 | 8600 to 8700         | Reserved for other ISO Tables   |
| 8577                 | Turkish                                 | 8701 to 32737        | Reserved for other 8-bit Tables |
| 8578                 | Greek                                   |                      |                                 |

**See [Character Code Tables](#) .**

## Character Pitch and Print Modes

---

### ESC [ p<sub>1</sub>;...p<sub>n</sub> m

**Select graphics rendition (SGR).**

|                   |                                              |
|-------------------|----------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ;...p <sub>n</sub> m    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B...p <sub>n</sub> 6D  |
| Decimal Value     | 27 91 p <sub>1</sub> 59...p <sub>n</sub> 109 |

This command selects fonts, pitch, print modes, character styles and colors according to the parameter settings:

| <b>p</b> | <b>DEFINITION</b>    |
|----------|----------------------|
| 0        | Normal Print Mode    |
| 1        | Bold Print Mode      |
| 2        | Subscript Mode       |
| 3        | Superscript Mode     |
| 4        | Underline Mode       |
| 5        | Expanded Mode        |
| 6        | Proportional         |
| 7        | Italic Mode          |
| 8 9      | Reserved             |
| 10       | Draft Font at 10 cpi |
| 11       | Draft Font at 10 cpi |
| 12       | LQ Gothic at 10 cpi  |
| 13       | Draft Font at 10 cpi |

| <b>p</b> | <b>DEFINITION</b>                       |
|----------|-----------------------------------------|
| 14       | LQ Courier at 10 cpi                    |
| 15       | Draft Italic at 10 cpi                  |
| 16       | LQ Gothic Italic at 10 cpi              |
| 17       | Draft Italic at 10 cpi                  |
| 18       | LQ Courier Italic at 10 cpi             |
| 19       | Draft at 10 cpi                         |
| 20       | Reserved                                |
| 21       | Double Underline Mode                   |
| 22       | Cancel Bold Mode                        |
| 23       | Reserved                                |
| 24       | Cancel Underline Mode (Single & Double) |
| 25       | Cancel Expanded Mode                    |
| 26       | Cancel Proportional Mode                |
| 30       | Select black (all ribbons)              |
| 31       | Mix yellow & magenta (Process Ribbon)   |
|          | Select red (Red/black Ribbon)           |
| 32       | Select yellow & cyan (Process Ribbon)   |
| 33       | Select yellow (Process Ribbon)          |
| 34       | Mix magenta & cyan (Process Ribbon)     |
| 35       | Select magenta (Process Ribbon)         |
| 36       | Select cyan (Process Ribbon)            |
| 50 53 55 | Reserved                                |

| <b>p</b> | <b>DEFINITION</b>            |
|----------|------------------------------|
| 60       | High speed draft at 10 cpi   |
| 61       | LQ Roman at 10 cpi           |
| 62       | LQ Prestige at 10 cpi        |
| 63       | LQ Script at 10 cpi          |
| 64       | LQ OCR-A at 10 cpi           |
| 65       | LQ OCR-B at 10 cpi           |
| 66       | LQ Orator at 10 cpi          |
| 67       | LQ Presentor at 10 cpi       |
| 68       | LQ Script-C at 10 cpi        |
| 70       | LQ Option style #1 at 10 cpi |
| 71       | LQ Option style #2 at 10 cpi |
| 72       | LQ Option style #3 at 10 cpi |
| 73       | LQ Option style #4 at 10 cpi |

**Subscript and Superscript modes are enabled via *System Menu* (ANSI OPTIONS-S/SCRIPT>Y) .**

**Refer to the *User's Manual* on the CD-Rom.**

---

## ESC [ p<sub>1</sub>; p<sub>2</sub> SP B

### Graphic size modification (GSM).

|                   |                                              |
|-------------------|----------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>2</sub> SP B   |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 20 42 |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 32 66 |

This command sets the height and/or width of expanded and oversized characters.

The p<sub>1</sub> and p<sub>2</sub> parameters are the percentages by which the height and width, respectively, will be multiplied. The default value of p<sub>1</sub> and p<sub>2</sub> is 100%.

The maximum expansion factor is 4200 and 800 for oversize mode and expanded, respectively.

---

## ESC [ p<sub>1</sub> t

### Special print mode (Oversize/Expanded/Bar code Mode - GENSPM).

|                   |                          |
|-------------------|--------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> t   |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 74  |
| Decimal Value     | 27 91 p <sub>1</sub> 116 |

This sequence selects/deselects oversize expanded or bar code mode according to the p<sub>1</sub> parameter value.

See the table below:

| p <sub>1</sub> | FUNCTION             |
|----------------|----------------------|
| 0              | Cancel special mode  |
| 1              | Select oversize mode |
| 2              | Select expanded mode |
| 3              | Select bar code mode |

It can select just one special print mode at a time.

---

## SO

### Shift out.

|                   |    |
|-------------------|----|
| ASCII Code        | SO |
| Hexadecimal Value | 0E |
| Decimal Value     | 14 |

This code enables Expanded/Oversize mode as determined by the last received ESC [p l t command.

---

## SI

### Shift in.

|                   |    |
|-------------------|----|
| ASCII Code        | SI |
| Hexadecimal Value | 0F |
| Decimal Value     | 15 |

This code disables the Expanded/Oversize modes determined by the last received ESC [p l t command.

---

## ESC [ p<sub>1</sub>; p<sub>n</sub> {

### Unidirectional printing (GENUPD).

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>n</sub> {    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>n</sub> 7B  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>n</sub> 123 |

This command selects the unidirectional or bi-directional printing according to the p parameter values:

| p | FUNCTION                          |
|---|-----------------------------------|
| 0 | Cancel unidirectional printing    |
| 1 | Print unidirectional LQ and DP    |
| 2 | Print unidirectional Dot Graphics |

---

## Horizontal Movements

---

### BS

#### **Back space.**

|                   |    |
|-------------------|----|
| ASCII Code        | BS |
| Hexadecimal Value | 08 |
| Decimal Value     | 8  |

The BS code moves the print head one character to the left at the current cpi.

---

### CR

#### **Carriage return.**

|                   |    |
|-------------------|----|
| ASCII Code        | CR |
| Hexadecimal Value | 0D |
| Decimal Value     | 13 |

This code causes the print head to be moved to the left margin on the current line.

---

### SP

#### **Space.**

|                   |    |
|-------------------|----|
| ASCII Code        | SP |
| Hexadecimal Value | 20 |
| Decimal Value     | 32 |

This code will position one character space to the right of the print head position.

---

## ESC [ p<sub>1</sub> '

### Horizontal position absolute (HPA).

|                   |                         |
|-------------------|-------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> '  |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 60 |
| Decimal Value     | 27 91 p <sub>1</sub> 96 |

This command causes the print position to be moved to the decipoint location specified by p<sub>1</sub>. This sequence can be used to print within the left, top and bottom margins.

---

## ESC [ p<sub>1</sub> a

### Horizontal position relative (HPR).

|                   |                         |
|-------------------|-------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> a  |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 61 |
| Decimal Value     | 27 91 p <sub>1</sub> 97 |

This command causes the print position to be moved to the right relative to the current position. The p<sub>1</sub> parameter specifies the number of decipoints. This command cannot be used to move beyond the right margin.

---

## ESC [ p<sub>1</sub>; p<sub>2</sub> s

### Left/right margin set (GENSLR).

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>2</sub> s    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 73  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 115 |

This command sets the left and right margin values. The p<sub>1</sub> parameter specifies the decipoint value of the left margin. The p<sub>2</sub> parameter specifies the decipoint value of the right margin value. The default value for the left margin is 0 while for the right margin it is the maximum width supported by the printer configuration (that is 13.6\*720=9792).

---

## ESC [ p<sub>1</sub> j

### Horizontal position backward (HPB).

|                   |                          |
|-------------------|--------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> j   |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 6A  |
| Decimal Value     | 27 91 p <sub>1</sub> 106 |

This command causes the current horizontal position to be moved backwards as specified by the p<sub>1</sub> parameter (decipoints).

---

## HT

### Horizontal tab.

|                   |    |
|-------------------|----|
| ASCII Code        | HT |
| Hexadecimal Value | 09 |
| Decimal Value     | 9  |

This code causes the print head to be moved to the next tab stop.

---

## ESC H or HTS

### Horizontal tab setting.

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC H or HTS                 |
| Hexadecimal Value | 1B 48 (7-bit) or 88 (8-bit)  |
| Decimal Value     | 27 72 (7-bit) or 136 (8-bit) |

This command causes a horizontal tab stop to be set to the decipoint value of the current print position.

---

## ESC[ p<sub>1</sub>; p<sub>n</sub> u

**Sets horizontal tab stops at specified positions multiple horizontal tab set (GENHTS).**

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC[ p <sub>1</sub> ; p <sub>n</sub> u     |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>n</sub> 75  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>n</sub> 117 |

This command sets up to 22 horizontal tab stops at each decipoint position specified by p parameters. When specifying more than one position, enter the parameters in ascending order.

## Vertical Movements

---

### LF

**Line feed.**

|                   |    |
|-------------------|----|
| ASCII Code        | LF |
| Hexadecimal Value | 0A |
| Decimal Value     | 10 |

This code positions the paper one line space as indicated by the current line spacing value.

---

### ESC D or IND

**Index.**

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC D or IND                 |
| Hexadecimal Value | 1B 44 (7-bit) or 84 (8-bit)  |
| Decimal Value     | 27 68 (7-bit) or 132 (8-bit) |

This command causes the paper to be positioned down one line space as indicated by the current line spacing value.

---

## ESC E or NEL

### Next line.

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC E or NEL                 |
| Hexadecimal Value | 1B 45 (7-bit) or 85 (8-bit)  |
| Decimal Value     | 27 69 (7-bit) or 133 (8-bit) |

This command causes the paper to be positioned down one line space as indicated by the current line spacing value. The column counter is reset to the left margin value.

---

## ESC K or PLD

### Partial line down.

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC K or PLD                 |
| Hexadecimal Value | 1B 4B (7-bit) or 8B (8-bit)  |
| Decimal Value     | 27 75 (7-bit) or 139 (8-bit) |

This command causes the paper to be positioned down one half line space at the current line spacing value. This may create an appearance of subscripting. This sequence is also used after an ESC L (partial line up sequence) to recover the original active vertical position.

---

## ESC L or PLU

### Partial line up.

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC L or PLU                 |
| Hexadecimal Value | 1B 4C (7-bit) or 8C (8-bit)  |
| Decimal Value     | 27 76 (7-bit) or 140 (8-bit) |

This command causes the paper to be positioned up one half line space at the current line spacing value. This may create an appearance of superscripting. This sequence is also used after an ESC K (partial line down sequence) to recover the original active vertical position.

---

## ESC M or RI

### Reverse index.

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC M or RI                  |
| Hexadecimal Value | 1B 4D (7-bit) or 8D (8-bit)  |
| Decimal Value     | 27 77 (7-bit) or 141 (8-bit) |

This command causes the paper to be positioned up one line space at the current line spacing value.

---

## ESC [ p<sub>1</sub> d

### Vertical position absolute (VPA).

|                   |                          |
|-------------------|--------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> d   |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 64  |
| Decimal Value     | 27 91 p <sub>1</sub> 100 |

This command causes the current vertical position to be set to the decipoint value specified by the p<sub>1</sub> parameter relative to the top most line of the current form length. This sequence can be used to print within the top and the bottom margins.

---

## ESC [ p<sub>1</sub> e

### Vertical position relative (VPR).

|                   |                          |
|-------------------|--------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> e   |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 65  |
| Decimal Value     | 27 91 p <sub>1</sub> 101 |

This command causes the current vertical position to be advanced to the position specified by the p<sub>1</sub> parameter (in decipoints) relative to the current print line position.

---

## ESC [ p<sub>1</sub>; p<sub>2</sub> f

### Horizontal and vertical position absolute (HVP).

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>2</sub> f    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 66  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 102 |

This command causes the current print position to be moved to the vertical (p<sub>1</sub>) and horizontal (p<sub>2</sub>) decipoint locations specified relative to the top left corner of the page.

This sequence can be used to print within the right, left, top and bottom margins.

---

## ESC [ p<sub>1</sub> k

### Vertical position backward (VPB).

|                   |                          |
|-------------------|--------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> k   |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 6B  |
| Decimal Value     | 27 91 p <sub>1</sub> 107 |

This command causes the current vertical position to be moved backwards as specified by the p<sub>1</sub> parameter (decipoints) relative to the current print line position.

---

## ESC [ p<sub>1</sub>; p<sub>n</sub> g

### Tab clear (TBC).

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>n</sub> g    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>n</sub> 67  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>n</sub> 103 |

This command clears horizontal & vertical tab stops. If no parameter is present, the horizontal tab stop at the current position is cleared (default).

| <b>p</b>    | <b>DESCRIPTION</b>                       |
|-------------|------------------------------------------|
| 0 (default) | Clear horizontal tab at current position |
| 1           | Clear vertical tab at current position   |
| 3           | Clear all horizontal tab stops           |
| 4           | Clear all vertical tab stops             |

---

## VT

### Vertical tab.

|                   |    |
|-------------------|----|
| ASCII Code        | VT |
| Hexadecimal Value | 0B |
| Decimal Value     | 11 |

This code causes printing to be moved to the left margin at the next vertical tab stop.

---

## ESC J or VTS

### Vertical tab setting.

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC J or VTS                 |
| Hexadecimal Value | 1B 4A (7-bit) or 8A (8-bit)  |
| Decimal Value     | 27 74 (7-bit) or 138 (8-bit) |

This command causes a vertical tab stop to be set to the decipoint value of the current vertical position.

---

## ESC [ p<sub>1</sub>; p<sub>n</sub> v

### Sets vertical tab stops at specified positions (Multiple Vertical Tab Set - GENVTS).

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>n</sub> v    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>n</sub> 76  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>n</sub> 118 |

This command sets up to 12 vertical tab stops at each decipoint position specified by p parameters. The tab stops are measured from the top of the page. When specifying more than one position, enter the parameters in ascending order.

---

## FF

### Form feed.

|                   |    |
|-------------------|----|
| ASCII Code        | FF |
| Hexadecimal Value | 0C |
| Decimal Value     | 12 |

This code causes the data in the print buffer to be printed out and then advances the paper to the top of the next form.

---

## ESC [ p<sub>1</sub>; p<sub>2</sub>; p<sub>3</sub> r

### Form definition (GENFD).

|                   |                                                              |
|-------------------|--------------------------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>2</sub> ; p <sub>3</sub> r     |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 3B p <sub>3</sub> 72  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 59 p <sub>3</sub> 114 |

This command sets the page length, top and bottom margins.

The p<sub>1</sub>, p<sub>2</sub> and p<sub>3</sub> parameters specify the decipoint values.

| p <sub>n</sub> | FUNCTION                                           |
|----------------|----------------------------------------------------|
| p <sub>1</sub> | Page Length                                        |
| p <sub>2</sub> | Top Margin Position From the Beginning of the Page |
| p <sub>3</sub> | Bottom Margin Position From the End of the Page    |

The maximum page length value is 15840 decipoints (22 inches).

---

## ESC [ p<sub>1</sub>; p<sub>2</sub> <SP> G

### Sets the line/character spacing.

|                   |                                              |
|-------------------|----------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>2</sub> <SP> G |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 20 47 |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 32 71 |

This command sets the spacing between lines (p<sub>1</sub> parameter) and the horizontal character pitch (p<sub>2</sub> parameter) in decipoints.

If the vertical spacing value exceeds the current form length, this setting will be ignored.

## Interface Control

---

### NUL

#### Ignored.

|                   |     |
|-------------------|-----|
| ASCII Code        | NUL |
| Hexadecimal Value | NUL |
| Decimal Value     | 00  |

This code is ignored.

---

### ETX

#### End of transmission.

|                   |     |
|-------------------|-----|
| ASCII Code        | ETX |
| Hexadecimal Value | 03  |
| Decimal Value     | 3   |

This code is used in conjunction with ACK for the ETX/ACK protocol. This protocol is enabled/disabled in the menu (see in the *System Menu*, under SERIAL OPTIONS, the SER:ETX/ACK function (SER:ETX/ACK>Y, SER:ETX/ACK>N), please refer to the *User's Manual* on the CD-Rom). The host transmits a block of characters followed by an ETX character. The host should transmit no more characters until it receives an ACK character from the printer.

However, the host may choose to transmit multiple blocks of data terminated with ETX even though the printer has not transmitted ACK. The data source is responsible for ensuring that it does not transmit a string of data that exceeds the capacity of the printer's receive buffer.

---

## ACK

### Acknowledge.

|                   |     |
|-------------------|-----|
| ASCII Code        | ACK |
| Hexadecimal Value | 06  |
| Decimal Value     | 6   |

This code is used in conjunction with ETX for the ETX/ACK protocol. This protocol is enabled/disabled in the menu (see in the *System Menu*, under SERIAL OPTIONS, the SER:ETX/ACK function (SER:ETX/ACK>Y, SER:ETX/ACK>N), please refer to the *User's Manual* on the CD-Rom).

The printer will transmit ACK at the currently selected baud rate and bit/parity selection. Transmission of the ACK is delayed until an ETX has been removed in the input buffer. An ACK will be transmitted for each ETX received even if there are multiple ETX in the buffer. Throughput may be reduced when this protocol is enabled. Does not affect function of DC1/DC3 protocol. Not valid in parallel interface protocol.

---

## ENQ

### Enquiry.

|                   |     |
|-------------------|-----|
| ASCII Code        | ENQ |
| Hexadecimal Value | 05  |
| Decimal Value     | 5   |

This code is used to request the message string defined by the [OSC](#) command when parameter p1=8 is transmitted to the host.

---

## DC1

### Selects printer (Data Control 1).

|                   |     |
|-------------------|-----|
| ASCII Code        | DC1 |
| Hexadecimal Value | 11  |
| Decimal Value     | 17  |

In parallel interface, after the printer has been deselected by DC3 code, this code will select again the printer.

In serial interface, this code is sent from the printer to the host to indicate that the printer is ready to receive data.

---

## DC3

### Deselects printer (Data Control 3).

|                   |     |
|-------------------|-----|
| ASCII Code        | DC3 |
| Hexadecimal Value | 13  |
| Decimal Value     | 19  |

In parallel interface, this code causes the printer to enter the standby condition until a DC1 code is received.

In serial interface, this code is sent from the printer to the host to indicate that it is not ready to receive data.

# Operating System Control

---

## BEL

### **Bell.**

|                   |     |
|-------------------|-----|
| ASCII Code        | BEL |
| Hexadecimal Value | 07  |
| Decimal Value     | 7   |

This code causes the buzzer to sound for about 0.5 second.

---

## DEL

### **Delete.**

|                   |     |
|-------------------|-----|
| ASCII Code        | DEL |
| Hexadecimal Value | 7F  |
| Decimal Value     | 127 |

In parallel interface, this code causes the last received character to be deleted.

---

## ESC

### **Escape.**

|                   |     |
|-------------------|-----|
| ASCII Code        | ESC |
| Hexadecimal Value | 1B  |
| Decimal Value     | 27  |

This code is used as an escape sequence introducer.

---

## ESC \ or ST

### String terminator.

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC \ or ST                  |
| Hexadecimal Value | 1B 5C (7-bit) or 9C (8-bit)  |
| Decimal Value     | 27 92 (7-bit) or 156 (8-bit) |

This command closes the other escape sequences including the operating system, **UDS** command and **dot graphics** commands.

---

## ESC Q or PU1

### Executes Selftest.

|                   |                              |
|-------------------|------------------------------|
| ASCII Code        | ESC Q or PU1                 |
| Hexadecimal Value | 1B 51 (7-bit) or 91 (8-bit)  |
| Decimal Value     | 27 81 (7-bit) or 145 (8-bit) |

In serial interface, upon receipt of this command the printer will transmit 1B 50 30 1B 5C.

---

## ESC c

### Resets to initial state (RIS).

|                   |       |
|-------------------|-------|
| ASCII Code        | ESC c |
| Hexadecimal Value | 1B 63 |
| Decimal Value     | 27 99 |

This command will write into the current format the printer parameters from the stored format assigned to the current path.

---

## ESC k

### Prints test character (GENPTC).

|                   |        |
|-------------------|--------|
| ASCII Code        | ESC k  |
| Hexadecimal Value | 1B 6B  |
| Decimal Value     | 27 107 |

This sequence causes one line of the print head test character to be printed.

---

## ESC [ p<sub>1</sub>...p<sub>n</sub> h

### Sets mode (SM).

|                   |                                              |
|-------------------|----------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ...p <sub>n</sub> h     |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B ...p <sub>n</sub> 68 |
| Decimal Value     | 27 91 p <sub>1</sub> 59...p <sub>n</sub> 104 |

This command sets a specific print mode according to the parameter value. If the first parameter (p<sub>1</sub>) is preceded by a ">" symbol then all parameters will be interpreted as proprietary defined parameters. If the ">" character is not specified, all parameters will be interpreted as ANSI defined parameters.

The proprietary defined parameter values are:

| p | MNEMONIC MODE | FUNCTION                  |
|---|---------------|---------------------------|
| 1 | GENPRM        | Proportional Print Mode   |
| 3 | GENCSI        | Single Character CSI Mode |
| 4 | GENBLD        | Bold Mode                 |
| 5 | GENCS2        | Character Set 2 Mode      |

The ANSI defined parameter values are:

| p  | MNEMONIC MODE | FUNCTION      |
|----|---------------|---------------|
| 0  |               | Ignored       |
| 20 | LMN           | Auto CR on LF |

---

## ESC [ p<sub>1</sub>; p<sub>n</sub> I

### Resets mode (RM).

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>n</sub> I    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>n</sub> 6C  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>n</sub> 108 |

This sequence resets the print mode(s) indicated by the p<sub>1</sub>/p<sub>n</sub> parameter(s).

---

## ESC [ p<sub>1</sub>; p<sub>2</sub> SP~

### Selects emulation (GENEMU).

|                   |                                               |
|-------------------|-----------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>2</sub> SP~     |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 20 7E  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 32 126 |

This sequence selects the emulation according to p values. Parameter p<sub>1</sub> is an emulation identifier value while p<sub>2</sub> is a reset control value.

| p <sub>1</sub> | p <sub>2</sub> | FUNCTION                                                                                           |
|----------------|----------------|----------------------------------------------------------------------------------------------------|
| 0              |                | GENICOM ANSI                                                                                       |
| 1 - 20         |                | Reserved                                                                                           |
| 21             |                | IBM Proprinter XL24/XL24E                                                                          |
| 22             |                | EPSON LQ-1050                                                                                      |
|                | 0              | Hold values (default). The current settings remain valid after changing the printer emulation.     |
|                | 1              | Full reset. The status of such parameters reverts to defaults dependent on the selected emulation. |

To select ANSI mode from the Proprinter XL24 mode and maintaining the parameters, the sequence would be: <ESC>[0; 0<SP>~Leading zeros and defaulting parameters are not guaranteed to be parsed and therefore should not be used by the application. Parameter p<sub>1</sub> & p<sub>2</sub> will be expressed as ASCII, not binary, values. In the example above, "0" is "30H, not "00H".

## ESC [ p<sub>1</sub>; p<sub>2</sub>; p<sub>3</sub> SP |

### Customer setup save/unsave (GENCSX).

|                   |                                                                 |
|-------------------|-----------------------------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>2</sub> ; p <sub>3</sub> SP       |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>2</sub> 3B p <sub>3</sub> 20 7C  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>2</sub> 59 p <sub>3</sub> 32 124 |

This sequence allows saving & restoring page and print definitions into or out of the current User Format. Parameter p<sub>1</sub> defines the general operation.

Parameter p<sub>2</sub> specifies the User Format to read from or to write as indicated by p<sub>1</sub>.

Parameter p<sub>3</sub> is not required. If p<sub>1</sub> = 0, the contents of the User Format specified by p<sub>2</sub> overwrites the current one.

If p<sub>1</sub> = 1, the current User Format is saved into the User Format specified by p<sub>2</sub>.

If p<sub>2</sub> is not specified, the default is the last selected Format.

| p <sub>2</sub> | FUNCTION                       |
|----------------|--------------------------------|
| 1              | Format 1 (NVRAM)               |
| 2              | Format 2 (NVRAM)               |
| 3              | Format 3 (NVRAM)               |
| 4              | Format 4 (NVRAM)               |
| 6              | ROM (resident memory defaults) |

## ESC ] p<sub>1</sub>;p<sub>2</sub>;p<sub>3</sub>;data <ST>

### Operating system command (Load Mode OSC).

|                   |                                                                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| ASCII Code        | ESC ] p <sub>1</sub> ;p <sub>2</sub> ;p <sub>3</sub> ;data <ST>                                                                                    |
| Hexadecimal Value | 1B 5D p <sub>1</sub> 3B p <sub>2</sub> 3B p <sub>3</sub> 3B data (7-bit)<br>9D p <sub>1</sub> 3B p <sub>2</sub> 3B p <sub>3</sub> 3B data (8-bit)  |
| Decimal Value     | 27 93 p <sub>1</sub> 3B p <sub>2</sub> 3B p <sub>3</sub> 3B data (7-bit)<br>157 p <sub>1</sub> 3B p <sub>2</sub> 3B p <sub>3</sub> 3B data (8-bit) |

This command is used to initiate the loading of auxiliary memory areas that can include auxiliary font definitions and stored graphics information. It must be terminated by an <ST> control string. The data format restricts the character set allowed within the sequence to the CR, LF, FF, HT and VT control codes and the ASCII character codes between 20H and 7EH inclusive.

| p <sub>1</sub> | p <sub>2</sub> | p <sub>3</sub> | DATA | DESCRIPTION                                                                                                                                                                                  |
|----------------|----------------|----------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0-5            |                |                |      | Data up to <ST> must be ignored                                                                                                                                                              |
| 6              | 1              | 0              | 0,1  | Menu Lock.<br>If data = 1, then MENU key is locked.<br>If data = 0, then MENU key is enabled. Displays "Key Locked" whenever key is depressed.<br>NVRAM is updated to reflect command.       |
| 6              | 2              | 0              | 0,1  | ONLINE Lock.<br>If data = 1, then ONLINE key is locked.<br>If data = 0, then ONLINE key is enabled. Displays "Key Locked" whenever key is depressed.<br>NVRAM is updated to reflect command. |
| 7              | 1              | 0              | data | LCD message - "data" is immediately displayed on the LCD.<br>Max. length: 16 characters.                                                                                                     |

| <b>P<sub>1</sub></b> | <b>P<sub>2</sub></b> | <b>P<sub>3</sub></b> | <b>DATA</b> | <b>DESCRIPTION</b>                                                                                                                                       |
|----------------------|----------------------|----------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7                    | 2                    | 0                    | data        | Name for Active Format - "data" is displayed on the LCD instead of previous format message and stored in NVRAM.<br>Max. length: 16 characters.           |
| 7                    | 2                    | 1                    | data        | Name for Format 1 - "data" is displayed on the LCD instead of previous format message and stored in NVRAM.<br>Max. length: 16 characters.                |
| 7                    | 2                    | 2                    | data        | Name for Format 2 - "data" is displayed on the LCD instead of previous format message and stored in NVRAM.<br>Max. length: 16 characters.                |
| 7                    | 2                    | 3                    | data        | Name for Format 3 - "data" is displayed on the LCD instead of previous format message and stored in NVRAM.<br>Max. length: 16 characters.                |
| 7                    | 2                    | 4                    | data        | Name for Format 4 - "data" is displayed on the LCD instead of previous format message and stored in NVRAM.<br>Max. length: 16 characters.                |
| 8                    | 0                    | 0                    | data        | Answerback message - stored in NVRAM and "data" is transmitted to host via serial I/F in response to ENQ code.<br>The max. length is 30 ASCII characters |
| 9                    |                      |                      |             | <b>User Defined Substitution</b>                                                                                                                         |

## Paper Path Selection

### ESC [ p<sub>1</sub>; p<sub>n</sub> p

**Assign source for forms (GENASF).**

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>n</sub> p    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>n</sub> 70  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>n</sub> 112 |

This command controls the modes of the optional Automatic Sheet Feeder and other paths for parking, loading and ejecting paper. The p parameter is an ASCII value.

See the following table:

| <b>p</b> | <b>PAPER PATH CONTROL</b>                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0        | Reserved                                                                                                                                                                                  |
| 1        | Load from ASF bin 1 at the next form boundary.                                                                                                                                            |
| 2        | Load from ASF bin 2 at the next form boundary.                                                                                                                                            |
| 3        | Load from ASF bin 3 at the next form boundary.                                                                                                                                            |
| 4        | Eject current sheet without a new paper loading. The printer is ONLINE and a new sheet will be loaded when data is received.                                                              |
| 5-7      | Reserved                                                                                                                                                                                  |
| 8        | Park paper in the current path. Fanfold can be moved backwards for two form lengths. This creates a "Paper Out" fault condition that exists until paper is loaded from the control panel. |
| 9        | Load paper from the selected paper path.                                                                                                                                                  |
| 10       | Select and load paper from the Front2. The current paper will be parked or ejected.                                                                                                       |

| <b>p</b> | <b>PAPER PATH CONTROL</b>                                                                                  |
|----------|------------------------------------------------------------------------------------------------------------|
| 11       | Select and load paper from the Front1. The current paper will be parked or ejected.                        |
| 13       | Select and load paper from the Front2. The current paper will be parked or ejected.                        |
| 14       | Reserved                                                                                                   |
| 15       | Select ASF (Bin 1). The current paper will be parked and a new sheet will be loaded from Bin 1 of the ASF. |
| 16       | Select ASF (Bin 2). The current paper will be parked and a new sheet will be loaded from Bin 2 of the ASF. |
| 17       | Select ASF (Bin 3). The current paper will be parked and a new sheet will be loaded from Bin 3 of the ASF. |

If ASF has not been selected (n=15/16/17 or via operator panel), then n=1-4 is ignored. The appropriate path option must be selected from the *System Menu* in order for the sheet feeder to work.

## User Defined Character Substitution

### ESC ] p<sub>1</sub>; p<sub>n</sub> <ST>

**User defined character substitution (GENUDS).**

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC ] p <sub>1</sub> ; p <sub>n</sub> <ST> |
| Hexadecimal Value | 1B 5D p <sub>1</sub> 3B p <sub>n</sub> 9C  |
| Decimal Value     | 27 93 p <sub>1</sub> 59 p <sub>n</sub> 156 |

This command allows specifying a substitution within a character set. The parameters are described in the following table:

| <b>p</b>                                         | <b>DESCRIPTION</b>                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| p <sub>1</sub>                                   | Must be 9                                                                                                                                                                                                                                                                                                                                                       |
| p <sub>2</sub>                                   | Control identifier:<br>0: Download new definition. This will install a new definition.<br>1: Erase definition.<br>Other: Reserved                                                                                                                                                                                                                               |
| p <sub>3</sub>                                   | Select ID. A numeric value indicating the identifier of the substitution set. This value will be used in the host selection sequence.                                                                                                                                                                                                                           |
| p <sub>4</sub> , p <sub>5</sub> , p <sub>6</sub> | Reserved                                                                                                                                                                                                                                                                                                                                                        |
| p <sub>7</sub>                                   | Reserved                                                                                                                                                                                                                                                                                                                                                        |
| p <sub>8</sub>                                   | ID Message. A literal string that identifies the substitution as a printable message.                                                                                                                                                                                                                                                                           |
| p <sub>9</sub> -p <sub>n</sub>                   | Character substitution triads. Each substitution will be a triad of values identifying:<br>1: Definition character. The character position to be substituted.<br>2: Source character. The character to substitute into the destination location. (See <a href="#">Character Generator</a> addresses)<br>3: Reserved (a zero or semicolon separator is required) |

# Graphics Control Functions

## ESC [ p<sub>1</sub> q

Select graphics mode/density (GENGRM).

|                   |                          |
|-------------------|--------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> q   |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 71  |
| Decimal Value     | 27 91 p <sub>1</sub> 113 |

This command selects the density of the graphics mode.

| p <sub>1</sub> | DPI (Horizontal) |       | Image   | dpi vertical | #bytes/dot-column |
|----------------|------------------|-------|---------|--------------|-------------------|
|                | AGM=N            | AGM=Y |         |              |                   |
| 0              | 72               | 60    | real    | 72           | 1 (6-bit mode)    |
| 1              | 144              | 120   | real    | 72           | 1 " "             |
| 3              | 216              | 180   | real    | 72           | 1 " "             |
| 10             | 180              | 180   | real    | 180          | 4 (24-bit mode)   |
| 11             | 360              | 360   | virtual | 180          | 4 " "             |

# ESC P data

## Enter dot graphics mode (Device Control String).

|                   |            |
|-------------------|------------|
| ASCII Code        | ESC P data |
| Hexadecimal Value | 1B 50 data |
| Decimal Value     | 27 80      |

This command causes the dot graphics mode to be enabled. The density is selected according to the GENGRM command.

The line spacing value automatically changes if 72-dpi resolution (6-bit mode) is active.

The line spacing value for 180-dpi resolution (24-bit mode) must be selected prior to entering graphics mode.

In 6-bit mode, only 6 bits of a data byte are required to determine which wires are fired. Therefore, only one byte is required for each graphics dot column.

In 24-bit mode, 24 bits of four data bytes are required to determine which wires are fired. Only 6 bits of each byte are used. Therefore four bytes are required for each graphics dot column.

### 6-bit mapping

|                 |         | 6 BITS IN 1 BYTE |
|-----------------|---------|------------------|
| PRINT HEAD WIRE |         | DATA BIT         |
| 1               | 2 & 3   | 0                |
| 3               | 4 & 5   | 1                |
| 6               | 7 & 8   | 2                |
| 8               | 9 & 10  | 3                |
| 11              | 12 & 13 | 4                |
| 13              | 14 & 15 | 5                |

Since bits 6 & 7 are ignored, wires 16-24 are not used. The state (0 or 1) of bits 6 and 7 must be conditioned so as to make the entire byte fall within the range 20H through 7EH.

# 24-bit mapping

| 24 BITS IN 1 BYTE |                 |          |
|-------------------|-----------------|----------|
| BYTE              | PRINT HEAD WIRE | DATA BIT |
| 1                 | 1               | 0        |
|                   | 2               | 1        |
|                   | 3               | 2        |
|                   | 4               | 3        |
|                   | 5               | 4        |
|                   | 6               | 5        |
| 2                 | 7               | 0        |
|                   | 8               | 1        |
|                   | 9               | 2        |
|                   | 10              | 3        |
|                   | 11              | 4        |
|                   | 12              | 5        |
| 3                 | 13              | 0        |
|                   | 14              | 1        |
|                   | 15              | 2        |
|                   | 16              | 3        |
|                   | 17              | 4        |
|                   | 18              | 5        |
| 4                 | 19              | 0        |
|                   | 20              | 1        |
|                   | 21              | 2        |
|                   | 22              | 3        |
|                   | 23              | 4        |
|                   | 24              | 5        |

## Barcode Functions

---

### ESC [ p<sub>1</sub>; p<sub>n</sub> }

Sets bar code parameters (GENBC).

|                   |                                            |
|-------------------|--------------------------------------------|
| ASCII Code        | ESC [ p <sub>1</sub> ; p <sub>n</sub> }    |
| Hexadecimal Value | 1B 5B p <sub>1</sub> 3B p <sub>n</sub> 7D  |
| Decimal Value     | 27 91 p <sub>1</sub> 59 p <sub>n</sub> 125 |

This command allows selection of the bar code characteristics such as style height, symbol rotation and so on. The command ESC [3 t enables the bar code mode while ESC [0 t disables the mode.

#### p<sub>1</sub>: Bar code style

| p <sub>1</sub> | FUNCTION                           |
|----------------|------------------------------------|
| 0              | Interleaved 2 of 5                 |
| 1              | Bidirectional 2 of 5               |
| 2              | Matrix 2 of 5                      |
| 3              | Industrial 2 of 5                  |
| 4              | Code 3 of 9 (default)              |
| 5              | EAN-8                              |
| 6              | EAN-13                             |
| 7              | Code 11                            |
| 9              | Codabar (default start/stop = a/t) |
| 10             | Codabar (default start/stop = b/n) |
| 11             | Codabar (default start/stop = c/*) |
| 12             | Codabar (default start/stop = d/e) |
| 13             | UPC-A                              |
| 14             | UPC-E                              |
| 15             | Code 93                            |

| <b>p<sub>1</sub></b> | <b>FUNCTION</b>              |
|----------------------|------------------------------|
| 16                   | Code 128 (subset A, B and C) |
| 17                   | Code 128 (subset A, B and C) |
| 18                   | Code 128 (subset A, B and C) |
| 19                   | MSI                          |
| 20                   | UPC 2 Supplemental           |
| 21                   | UPC 5 Supplemental           |
| 22                   | EAN 2 Supplemental           |
| 23                   | EAN 5 Supplemental           |
| 50                   | Postnet                      |

### **p<sub>2</sub>: Barcode Height**

| <b>p<sub>2</sub></b> | <b>FUNCTION</b>                     |
|----------------------|-------------------------------------|
| 1                    | Minimum bar code height (1/12 inch) |
| 120                  | Maximum bar code height (10 inches) |
| 12                   | Default bar code height (1 inch)    |

### **p<sub>3</sub>: Human Readable Input (HRI)**

| <b>p<sub>3</sub></b> | <b>FUNCTION</b>                       |
|----------------------|---------------------------------------|
| 0                    | Disables printing of the HRI          |
| 1                    | Enables printing of the HRI (default) |

### **p<sub>4</sub>: Narrow Bar**

Default width value: 2 (120, 144 and 180 dpi)

### **p<sub>5</sub>: Wide Bar Width**

Default width value: 3 (120, 144 dpi), 4 (180 dpi)

### **p<sub>6</sub>: Narrow Space Width**

Default width value: 6 (120, 144 and 180 dpi)

**p<sub>7</sub>: Wide Space Width**

Default width value: 7 (120, 144 dpi), 8 (180 dpi)

**p<sub>8</sub>: Intercharacter Space Width**

Default width value: 3 (120, 144 dpi), 4 (180 dpi)

**p<sub>9</sub>: Rotation**

| <b>p<sub>9</sub></b> | <b>FUNCTION</b>                    |
|----------------------|------------------------------------|
| 0                    | 0 degrees using current font       |
| 1                    | 0 degrees using special HRI font   |
| 2                    | 90 degrees using special HRI font  |
| 3                    | 180 degrees using special HRI font |
| 4                    | 270 degrees using special HRI font |

**p<sub>10</sub>: Horizontal Print Density for Bar Codes Printed**

| <b>p<sub>10</sub></b> | <b>FUNCTION</b>                       |
|-----------------------|---------------------------------------|
| 1                     | 120 dpi horizontal density            |
| 2                     | 144 dpi horizontal density (Reserved) |
| 3                     | 180 dpi horizontal density            |

**p<sub>11</sub>: Check Digit**

| <b>p<sub>11</sub></b> | <b>FUNCTION</b>                    |
|-----------------------|------------------------------------|
| 0                     | No check digit requested (default) |
| 1                     | Check digit requested              |

**p<sub>12</sub>: Human Readable Font - Reserved****p<sub>13</sub>: Bar Code Height (in 1/24th-inch increments) - Reserved**

# Basic Program Sample

```
100 DEFSTR F:RSC=CHR$(27) 'Define Escape character
110 WIDTH "LPT1:",255
120 LPRINT "FOLLOWING ARE SOME OF THIS PRINTER'S ";
121 LPRINT "FEATURES USING THE ANSI EMULATION"
130 LPRINT ESC;"[;72 G";"10 CPI (PICA)"
140 LPRINT ESC;"[;60 G";"12 CPI (ELITE)"
150 LPRINT ESC;"[;48 G";"15 CPI"
160 LPRINT ESC;"[;72 G";"10 CPI"
170 LPRINT
180 LPRINT ESC;"[6m";"PROPORTIONAL MODE"
190 LPRINT ESC;"[0m";"BACK TO NORMAL"
200 LPRINT
210 LPRINT ESC;"[5m";"DOUBLE-WIDE MODE"
220 LPRINT ESC;"[0m";"BACK TO NORMAL"
230 LPRINT
240 LPRINT ESC;"[1m";"BOLD PRINTING"
250 LPRINT ESC;"[0m";"BACK TO NORMAL"
260 LPRINT ESC;"[1m";"BOLD PRINTING"
270 LPRINT ESC;"[0m";"BACK TO NORMAL"
280 LPRINT
290 LPRINT ESC;"L";"PARTIAL LINE UP ";
300 LPRINT ESC;"K";"/ ";
310 LPRINT ESC;"K";"PARTIAL LINE DOWN ";
320 LPRINT ESC;"L";"BACK TO NORMAL"
330 LPRINT
340 LPRINT ESC;"[4m";"UNDERLINE MODE"
350 LPRINT ESC;"[0m";"BACK TO NORMAL"
360 LPRINT
370 LPRINT "          1          2          3";
371 LPRINT "          4          5          6";
380 LPRINT "1234567890123456789012345678901234567890";
381 LPRINT "12345678901234567890"
390 LPRINT
400 LPRINT ESC;"[10m";"DRAFT PRINT MODE"
410 REM
420 LPRINT ESC;"[720;2880a";
430 REM
440 LPRINT "LEFT MARGIN NOW BEGINS AT 1 INCH AND ";
441 LPRINT "RIGHT MARGIN NOW ENDS AT 4 INCHES"
450 LPRINT ESC;"[0;9792s"
460 REM
470 LPRINT "LEFT MARGIN NOW BEGINS AT 0 INCH AND ";
471 LPRINT "RIGHT MARGIN NOW ENDS AT 13.6 INCHES"
480 LPRINT
490 LPRINT ESC;"[62m";"LQ PRINT MODE (Prestige)"
500 LPRINT
510 LPRINT ESC;"[120; G";
520 FOR I=1 TO 3
530 LPRINT "1/6 INCH LINE FEED"
540 NEXT I
550 LPRINT
560 LPRINT ESC;"[90; G";
570 FOR J=1 TO 3
580 LPRINT "1/8 INCH LINE FEED"
590 NEXT J
600 LPRINT ESC;"[120; G";"NOW 1/6 INCH LINE FEED"
610 LPRINT "A FORMFEED <FF> FOLLOWS THIS LINE";CHR$(12)
620 END
```

## Basic Program Printed Output

FOLLOWING ARE SOME OF THIS PRINTER'S FEATURES USING THE ANSI EMULATION  
10 CPI (PICA)  
12 CPI (ELITE)  
15 CPI  
10 CPI

PROPORTIONAL MODE  
BACK TO NORMAL

DOUBLE-WIDE MODE  
BACK TO NORMAL

BOLD PRINTING  
BACK TO NORMAL  
BOLD PRINTING  
BACK TO NORMAL

PARTIAL LINE UP / PARTIAL LINE DOWN BACK TO NORMAL

UNDERLINE MODE  
BACK TO NORMAL

| 1                                                            | 2 | 3 | 4 | 5 | 6 |
|--------------------------------------------------------------|---|---|---|---|---|
| 123456789012345678901234567890123456789012345678901234567890 |   |   |   |   |   |

DRAFT PRINT MODE  
LEFT MARGIN NOW BEGINS AT 1 IN  
CH AND RIGHT MARGIN NOW ENDS AT  
T 4 INCHES

LEFT MARGIN NOW BEGINS AT 0 INCH AND RIGHT MARGIN NOW ENDS AT 13.6 INCHES

LQ PRINT MODE (Prestige)

1/6 INCH LINE FEED  
1/6 INCH LINE FEED  
1/6 INCH LINE FEED

1/8 INCH LINE FEED  
1/8 INCH LINE FEED  
1/8 INCH LINE FEED  
NOW 1/6 INCH LINE FEED  
A FORMFEED <FF> FOLLOWS THIS LINE

# Tables

This section contains the character sets and the hexadecimal to decimal conversion table.

## Character Sets

### Character Set 1 (CS1)

|    | 00  | 10  | 20 | 30 | 40 | 50 | 60 | 70  | 80  | 90  | A0 | B0 | C0 | D0 | E0 | F0 |
|----|-----|-----|----|----|----|----|----|-----|-----|-----|----|----|----|----|----|----|
| 00 | NUL |     | SP | 0  | @  | P  | '  | p   | NUL |     | á  |    | À  | Ð  | ª  | =  |
| 01 |     | DC1 | !  | 1  | A  | Q  | a  | q   |     | DC1 | í  |    | Á  | Ñ  | Ë  | ±  |
| 02 |     | DC2 | “  | 2  | B  | R  | b  | r   |     | DC2 | ó  |    | Â  | Ò  | G  | =  |
| 03 |     | DC3 | #  | 3  | C  | S  | c  | s   |     | DC3 | ú  | ³  | Ã  | Ó  | P  | =  |
| 04 |     | DC4 | \$ | 4  | D  | T  | d  | t   |     | DC4 | ñ  | ´  | Ä  | Ô  | S  | (  |
| 05 |     |     | %  | 5  | E  | U  | e  | u   |     |     | Ñ  | µ  | Å  | Õ  | ß  | )  |
| 06 |     |     | &  | 6  | F  | V  | f  | v   |     |     | ª  | ¶  | Æ  | Ö  | µ  | +  |
| 07 | BEL |     | '  | 7  | G  | W  | g  | w   | BEL |     | º  | ·  | Ç  | ×  | ¸  | ~  |
| 08 | BS  | CAN | (  | 8  | H  | X  | h  | x   | BS  | CAN | ¿  | ,  | È  | Ø  | °  |    |
| 09 | HT  |     | )  | 9  | I  | Y  | i  | y   | HT  |     | ¬  | ı  | É  | Ù  | T  | ·  |
| 0A | LF  |     | *  | :  | J  | Z  | j  | z   | LF  |     | ¬  | º  | Ê  | Ú  | O  | ·  |
| 0B | VT  | ESC | +  | ;  | K  | [  | k  | {   | VT  | ESC | ¼  | »  | Ë  |    | d  | v  |
| 0C | FF  |     | ,  | <  | L  | \  | l  |     | FF  |     | ¾  | ¼  | Ì  | —  | 8  | n  |
| 0D | CR  |     | -  | =  | M  | ]  | m  | }   | CR  |     | ı  | ½  | Í  |    | f  | ²  |
| 0E | SO  |     | .  | >  | N  | ^  | n  | ~   | SO  |     | «  | ¾  | Î  |    | e  |    |
| 0F | SI  |     | /  | ?  | O  | _  | o  | DEL | SI  |     | »  | ¿  | Ï  | ˆ  | n  | SP |

## Character Set 2 (CS2)

|    | 00  | 10  | 20 | 30 | 40 | 50 | 60 | 70  | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|-----|-----|----|----|----|----|----|-----|----|----|----|----|----|----|----|----|
| 00 | NUL |     | SP | 0  | @  | P  | '  | p   | Ç  | É  | á  |    | À  | Đ  | a  | =  |
| 01 |     | DC1 | !  | 1  | A  | Q  | a  | q   | ü  | æ  | í  |    | Á  | Ñ  | ß  | ±  |
| 02 | `   | DC2 | “  | 2  | B  | R  | b  | r   | é  | Æ  | ó  |    | Â  | Ò  | G  | =  |
| 03 | ♥   | DC3 | #  | 3  | C  | S  | c  | s   | â  | ô  | ú  | ³  | Ã  | Ó  | p  | =  |
| 04 | ♦   | DC4 | \$ | 4  | D  | T  | d  | t   | ä  | ö  | ñ  | ´  | Ä  | Ô  | S  | (  |
| 05 | ♣   | §   | %  | 5  | E  | U  | e  | u   | à  | ò  | Ñ  | µ  | Å  | Õ  | s  | )  |
| 06 | ♠   |     | &  | 6  | F  | V  | f  | v   | å  | û  | ª  | ¶  | Æ  | Ö  | µ  | ÷  |
| 07 | BEL |     | ‘  | 7  | G  | W  | g  | w   | ç  | ù  | °  | ·  | Ç  | ×  | t  | ~  |
| 08 | BS  | CAN | (  | 8  | H  | X  | h  | x   | ê  | ÿ  | ¿  | ,  | È  | Ø  | F  | °  |
| 09 | HT  |     | )  | 9  | I  | Y  | i  | y   | ë  | ö  | ¬  | ı  | É  | Û  | T  | ·  |
| 0A | LF  |     | *  | :  | J  | Z  | j  | z   | è  | Ü  | ¬  | °  | Ê  | Ú  | O  | ·  |
| 0B | VT  | ESC | +  | ;  | K  | [  | k  | {   | ı  | ¢  | ¼  | »  | Ë  |    | d  | v  |
| 0C | FF  |     | ,  | <  | L  | \  | l  |     | î  | £  | ¼  | ¼  | Ì  | _  | 8  | n  |
| 0D | CR  |     | -  | =  | M  | ]  | m  | }   | ì  | ¥  | ı  | ½  | Í  |    | f  | ²  |
| 0E | SO  |     | .  | >  | N  | ^  | n  | ~   | Ă  | P  | «  | ¾  | Î  |    | e  |    |
| 0F | SI  |     | /  | ?  | O  | _  | o  | DEL | À  | f  | »  | ¿  | Ï  | ˆ  | n  | SP |

# IBM – All Character Sets

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 0  | ►  |    | 0  | @  | P  | `  | p  | Ç  | Ē  | á  | ☼  | ℓ  | ⌚  | α  | ≡  |
| 01 | ⊕  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | æ  | í  | ☼  | ⊥  | ⌚  | β  | ±  |
| 02 | ⊕  | †  | "  | 2  | B  | R  | b  | r  | é  | Æ  | ó  | ☼  | ⌚  | ⌚  | Γ  | ≥  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    | ⌚  | ⌚  | π  | ≤  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | ⌚  | —  | ℓ  | Σ  | ∫  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | Ñ  | ⌚  | †  | ℓ  | σ  | ∫  |
| 06 | ♣  | —  | &  | 6  | F  | V  | f  | v  | a  | û  | æ  | ⌚  | ⌚  | ⌚  | μ  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | ç  | ù  | œ  | ⌚  | ⌚  | ⌚  | τ  | ≈  |
| 08 | ■  | †  | (  | 8  | H  | X  | h  | x  | ê  | ÿ  | ¿  | ⌚  | ⌚  | ⌚  | Φ  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | ö  | ⌚  | ⌚  | ⌚  | ⌚  | Θ  | •  |
| 0A | ■  | →  | *  | :  | J  | Z  | j  | z  | è  | ù  | ⌚  | ⌚  | ⌚  | ⌚  | Ω  | •  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | ç  | ½  | ⌚  | ⌚  | ■  | δ  | √  |
| 0C | ♀  | ⌚  | ,  | <  | L  | \  | l  |    | í  | £  | ¼  | ⌚  | ⌚  | ■  | ∞  | n  |
| 0D | ♪  | ↔  | —  | =  | M  | ]  | m  | }  | ì  | ¥  | ;  | ⌚  | =  | ■  | ∅  | ²  |
| 0E | ♂  | ▲  | .  | >  | N  | ^  | n  | ~  | À  | ⌚  | «  | ⌚  | ⌚  | ■  | ε  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | —  | o  | ó  | À  | ƒ  | »  | ⌚  | ±  | ■  | ∩  |    |

# EPSON Italic Character Set

|    | 00  | 10  | 20 | 30 | 40 | 50 | 60 | 70  | 80  | 90  | A0 | B0 | C0 | D0 | E0 | F0 |
|----|-----|-----|----|----|----|----|----|-----|-----|-----|----|----|----|----|----|----|
| 00 | NUL |     | SP | 0  | @  | P  | `  | p   | NUL |     |    | o  | @  | P  | `  | p  |
| 01 |     | DC1 | !  | 1  | A  | Q  | a  | q   | DC1 | !   | 1  | A  | Q  | a  | q  |    |
| 02 |     | DC2 | "  | 2  | B  | R  | b  | r   | DC2 | "   | 2  | B  | R  | b  | r  |    |
| 03 |     | DC3 | #  | 3  | C  | S  | c  | s   | DC3 | #   | 3  | C  | S  | c  | s  |    |
| 04 |     | DC4 | \$ | 4  | D  | T  | d  | t   | DC4 | \$  | 4  | D  | T  | d  | t  |    |
| 05 |     |     | %  | 5  | E  | U  | e  | u   |     |     | %  | 5  | E  | U  | e  | u  |
| 06 |     |     | &  | 6  | F  | V  | f  | v   |     |     | &  | 6  | F  | V  | f  | v  |
| 07 | BEL |     | '  | 7  | G  | W  | g  | w   | BEL |     | '  | 7  | G  | W  | g  | w  |
| 08 | BS  | CAN | (  | 8  | H  | X  | h  | x   | BS  | CAN | (  | 8  | H  | X  | h  | x  |
| 09 | HT  |     | )  | 9  | I  | Y  | i  | y   | HT  |     | )  | 9  | I  | Y  | i  | y  |
| 0A | LF  |     | *  | :  | J  | Z  | j  | z   | LF  |     | *  | :  | J  | Z  | j  | z  |
| 0B | VT  | ESC | +  | ;  | K  | [  | k  | {   | VT  | ESC | +  | ;  | K  | [  | k  | {  |
| 0C | FF  |     | ,  | <  | L  | \  | l  |     | FF  |     | ,  | <  | L  |    | l  | /  |
| 0D | CR  |     | -  | =  | M  | ]  | m  | }   | CR  |     | -  | =  | M  | ]  | m  | }  |
| 0E | SO  |     | .  | >  | N  | ^  | n  | ~   | SO  |     | .  | >  | N  | ^  | n  | ~  |
| 0F | SI  |     | /  | ?  | O  | _  | o  | DEL | SI  |     | /  | ?  | O  | _  | o  | SP |

# ANSI Emulation - Character Set 1 Enabled (8 Bit Control Disabled)

|    | 00  | 10  | 20 | 30 | 40 | 50 | 60 | 70  | 80  | 90  | A0 | B0 | C0 | D0 | E0 | F0 |
|----|-----|-----|----|----|----|----|----|-----|-----|-----|----|----|----|----|----|----|
| 00 | NUL |     | SP | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 01 |     | DC1 | x  | x  | x  | x  | x  | x   |     | DC1 | x  | x  | x  | x  | x  | x  |
| 02 |     |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 03 | ETX | DC3 | x  | x  | x  | x  | x  | x   |     | DC3 | x  | x  | x  | x  | x  | x  |
| 04 |     |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 05 | ENQ |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 06 | ACK |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 07 | BEL |     | x  | x  | x  | x  | x  | x   | BEL |     | x  | x  | x  | x  | x  | x  |
| 08 | BS  |     | x  | x  | x  | x  | x  | x   | BS  |     | x  | x  | x  | x  | x  | x  |
| 09 | HT  |     | x  | x  | x  | x  | x  | x   | HT  |     | x  | x  | x  | x  | x  | x  |
| 0A | LF  |     | x  | x  | x  | x  | x  | x   | LF  |     | x  | x  | x  | x  | x  | x  |
| 0B | VT  | ESC | x  | x  | x  | x  | x  | x   | VT  | ESC | x  | x  | x  | x  | x  | x  |
| 0C | FF  |     | x  | x  | x  | x  | x  | x   | FF  |     | x  | x  | x  | x  | x  | x  |
| 0D | CR  |     | x  | x  | x  | x  | x  | x   | CR  |     | x  | x  | x  | x  | x  | x  |
| 0E | SO  |     | x  | x  | x  | x  | x  | x   | SO  |     | x  | x  | x  | x  | x  | x  |
| 0F | SI  |     | x  | x  | x  | x  | x  | DEL | SI  |     | x  | x  | x  | x  | x  |    |

# ANSI Emulation - Character Set 1 Enabled (8 Bit Control Enabled)

|    | 00  | 10  | 20 | 30 | 40 | 50 | 60 | 70  | 80  | 90  | A0 | B0 | C0 | D0 | E0 | F0 |
|----|-----|-----|----|----|----|----|----|-----|-----|-----|----|----|----|----|----|----|
| 00 | NUL |     | SP | x  | x  | x  | x  | x   |     | DCS | x  | x  | x  | x  | x  | x  |
| 01 |     | DC1 | x  | x  | x  | x  | x  | x   |     | PU1 | x  | x  | x  | x  | x  | x  |
| 02 |     |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 03 | ETX | DC3 | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 04 |     |     | x  | x  | x  | x  | x  | x   | IND |     | x  | x  | x  | x  | x  | x  |
| 05 | ENQ | x   | x  | x  | x  | x  | x  | x   | NEL |     | x  | x  | x  | x  | x  | x  |
| 06 | ACK |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 07 | BEL |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 08 | BS  |     | x  | x  | x  | x  | x  | x   | HTS |     | x  | x  | x  | x  | x  | x  |
| 09 | HT  |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 0A | LF  |     | x  | x  | x  | x  | x  | x   | VTS |     | x  | x  | x  | x  | x  | x  |
| 0B | VT  | ESC | x  | x  | x  | x  | x  | x   | PLD | CSI | x  | x  | x  | x  | x  | x  |
| 0C | FF  |     | x  | x  | x  | x  | x  | x   | PLU | ST  | x  | x  | x  | x  | x  | x  |
| 0D | CR  |     | x  | x  | x  | x  | x  | x   | RI  |     | x  | x  | x  | x  | x  | x  |
| 0E | SO  |     | x  | x  | x  | x  | x  | x   |     |     | x  | x  | x  | x  | x  | x  |
| 0F | SI  |     | x  | x  | x  | x  | x  | DEL |     |     | x  | x  | x  | x  | x  |    |

# ANSI Emulation - Character Set 2 Enabled

|    | 00  | 10  | 20 | 30 | 40 | 50 | 60 | 70  | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|-----|-----|----|----|----|----|----|-----|----|----|----|----|----|----|----|----|
| 00 | NUL |     | SP | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 01 |     | DC1 | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 02 |     |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 03 | ETX | DC3 | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 04 |     |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 05 | ENQ | x   | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 06 | ACK |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 07 | BEL |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 08 | BS  |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 09 | HT  |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 0A | LF  |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 0B | VT  | ESC | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 0C | FF  |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 0D | CR  |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 0E | SO  |     | x  | x  | x  | x  | x  | x   | x  | x  | x  | x  | x  | x  | x  | x  |
| 0F | SI  |     | x  | x  | x  | x  | x  | DEL | x  | x  | x  | x  | x  | x  | x  |    |

# Character Code Tables

## CP 437 (USA/Western Europe)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | Ø  | ►  |    | 0  | @  | P  | '  | p  | Ç  | É  | á  |    | À  | Ð  | ä  | =  |
| 01 | ð  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | æ  | í  |    | Á  | Ñ  | ß  | ±  |
| 02 | Λ  | ↕  | “  | 2  | B  | R  | b  | r  | é  | Æ  | ó  |    | Â  | Ò  | G  | =  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  | ³  | Ã  | Ó  | P  | =  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | ´  | Ä  | Ö  | S  | (  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | ñ  | µ  | Å  | Ö  | s  | )  |
| 06 | ♠  | -  | &  | 6  | F  | V  | f  | v  | å  | û  | *  | ¶  | Æ  | Ö  | µ  | +  |
| 07 | •  | ±  | ‘  | 7  | G  | W  | g  | w  | ç  | ù  | °  | ·  | Ç  | ×  | t  | ~  |
| 08 | .  | ↑  | (  | 8  | H  | X  | h  | x  | ê  | y  | ¿  | ,  | È  | Ø  | F  | °  |
| 09 | °  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | ö  | ¬  | ı  | É  | Ù  | T  | ·  |
| 0A |    | →  | *  | :  | J  | Z  | j  | z  | è  | Û  | ¬  | °  | Ê  | Ú  | O  | ·  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | €  | ½  | »  | Ë  |    | d  | v  |
| 0C | ♀  | À  | ,  | <  | L  | \  | l  |    | î  | £  | ¼  | ¼  | Ì  | _  | 8  | n  |
| 0D | ♪  | ↔  | -  | =  | M  | ]  | m  | }  | ì  | ¥  | ı  | ½  | Í  |    | f  | ²  |
| 0E | ♫  | ▲  | .  | >  | N  | ^  | n  | ~  | Ä  | P  | «  | ¾  | Î  |    | e  |    |
| 0F | Ψ  | ▼  | /  | ?  | O  | _  | o  | □  | Å  | f  | »  | ¿  | Ï  | -  | n  |    |

# CP 850 (Multilingual)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | Ø  | ►  |    | 0  | @  | P  | '  | p  | Ç  | É  | á  |    | À  | ø  | Ó  | –  |
| 01 | ø  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | æ  | í  |    | Á  | Ð  | ß  | ±  |
| 02 | Λ  | ↑  | “  | 2  | B  | R  | b  | r  | é  | Æ  | ó  |    | Â  | Ê  | Ô  | _  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  | ³  | Ã  | Ë  | Ö  | ¾  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | '  | Ä  | È  | ö  | ¶  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | Ñ  | Á  | À  | ı  | Õ  | §  |
| 06 | ♠  | –  | &  | 6  | F  | V  | f  | v  | å  | û  | ˆ  | Â  | â  | í  | μ  | ÷  |
| 07 | •  | ‡  | ·  | 7  | G  | W  | g  | w  | ç  | ù  | ˚  | À  | Ã  | î  | þ  | ,  |
| 08 | .  | ↑  | (  | 8  | H  | X  | h  | x  | ê  | ÿ  | ¿  | ©  | Ê  | Ï  | ƒ  | °  |
| 09 | °  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | Ö  | ®  | ı  | É  | Û  | Ú  | ˆ  |
| 0A |    | →  | *  | :  | J  | Z  | j  | z  | è  | Ü  | ¬  | °  | Ê  | Ú  | Û  | ·  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ı  | ø  | ½  | »  | Ê  |    | Û  | ı  |
| 0C | ♀  | À  | ,  | <  | L  | \  | l  |    | î  | £  | ¼  | ¼  | ì  | _  | ý  | ³  |
| 0D | ♪  | ↔  | -  | =  | M  | ]  | m  | }  | ì  | Ø  | ı  | €  | Í  | ı  | Ý  | ²  |
| 0E | ♪  | ▲  | .  | >  | N  | ^  | n  | ~  | Ä  | ×  | «  | ¥  | Î  | ì  | ˉ  |    |
| 0F | Ψ  | ▼  | /  | ?  | O  | _  | o  | ◊  | Å  | f  | »  | ¿  | □  | ˉ  | '  |    |

# CP 851 (Greek)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | ø  | ►  |    | 0  | @  | P  | `  | p  | Ç  | ı  | ü  | ı  | ı  | T  | ç  | -  |
| 01 | ⊕  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  |    | ı  | ı  | ı  | Y  | η  | ±  |
| 02 | ●  | ↑  | "  | 2  | B  | R  | b  | r  | é  | ı  | ó  | ı  | ı  | Φ  | θ  | υ  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    |    | X  | ι  | φ  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | A  |    | -  | Ψ  | κ  | χ  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | γ  | B  | K  | ı  | Ω  | λ  | §  |
| 06 | ♠  | -  | &  | 6  | F  | V  | f  | v  | À  | û  | Γ  | Λ  | Π  | α  | μ  | ψ  |
| 07 | •  | ı  | '  | 7  | G  | W  | g  | w  | ç  | ù  | Δ  | M  | P  | β  | ν  | ,  |
| 08 | ■  | ↑  | (  | 8  | H  | X  | h  | x  | ê  | Ω  | E  | N  | ı  | γ  | ξ  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | Ö  | Z  | ı  | ı  | ı  | ο  | ¨  |
| 0A | ⊗  | →  | *  | :  | J  | Z  | j  | z  | è  | Ù  | H  | ı  | ı  | ı  | π  | ω  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | ά  | ı  | ı  | ı  | ı  | ρ  | ü  |
| 0C | ♀  | └  | ,  | <  | L  | \  | l  |    | ı  | £  | Θ  | ı  | ı  | ı  | σ  | û  |
| 0D | ♪  | ↔  | -  | =  | M  | ]  | m  | }  | E  | é  | I  | Σ  | =  | δ  | ς  | ώ  |
| 0E | ♫  | ▲  | .  | >  | N  | ^  | n  | ~  | Å  | ή  | «  | O  | ı  | ε  | τ  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | _  | o  | ó  | H  | ı  | »  | ı  | Σ  | ı  | '  |    |

## CP 852 (Eastern Europe)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | ø  | ►  |    | 0  | @  | P  | `  | p  | Ç  | É  | á  | Ê  | Ł  | đ  | ó  | -  |
| 01 | ⊕  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | L  | í  | Š  | ±  | Đ  | β  | "  |
| 02 | ⊙  | ↑  | "  | 2  | B  | R  | b  | r  | é  | Í  | ó  | Ẃ  | ⌈  | Đ  | Ô  | ,  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    | †  | È  | Ń  | ˘  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | Ą  | ‡  | —  | đ  | ń  | ˘  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | û  | Ł  | ą  | Á  | †  | Ń  | ň  | §  |
| 06 | ♠  | _  | &  | 6  | F  | V  | f  | v  | é  | Í  | ž  | À  | À  | í  | š  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | ç  | š  | ž  | È  | ä  | †  | š  | ,  |
| 08 | ■  | ↑  | (  | 8  | H  | X  | h  | x  | ł  | ś  | Ę  | Ś  | Ł  | ě  | Ř  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | Ö  | ę  | ¶  | ŕ  | ǰ  | Ů  | ˆ  |
| 0A | ◼  | →  | *  | :  | J  | Z  | j  | z  | ö  | ù  |    |    | ≡  | ┐  | ř  | •  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ö  | †  | ž  | ¶  | ¶  | ■  | Ů  | ü  |
| 0C | ♀  | └  | ,  | <  | L  | \  | l  |    | ı  | č  | č  | „  | †  | ■  | ý  | Ř  |
| 0D | ♪  | ↔  | -  | =  | M  | ]  | m  | }  | ž  | Ł  | ś  | ž  | =  | ‡  | ý  | ř  |
| 0E | ♫  | ▲  | .  | >  | N  | ^  | n  | ~  | Ä  | ×  | «  | ž  | †  | Ů  | č  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | _  | o  | ó  | č  | č  | »  | ┐  | ¤  | ■  | ˘  |    |

# CP 853 (Turkish)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 0  | ►  |    | 0  | @  | P  | `  | p  | Ç  | É  | Á  | ⌘  | ⌘  | ⌘  | ó  | -  |
| 01 | ⊕  | ◄  | !  | 1  | À  | Q  | a  | q  | ü  | è  | í  | ⌘  | ⌘  | ⌘  | β  |    |
| 02 | ⊗  | ↑  | "  | 2  | B  | R  | b  | r  | é  | ç  | ó  | ⌘  | ⌘  | ⌘  | ô  | ℓ  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    |    | ⌘  | ò  | h  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  |    | -  | ⌘  | é  | ˘  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | ñ  | À  | †  | 1  | g  | §  |
| 06 | ♠  | -  | &  | 6  | F  | V  | f  | v  | ê  | û  | ç  | À  | §  | í  | μ  | ÷  |
| 07 | •  | ↑  | '  | 7  | G  | W  | g  | w  | ç  | ù  | ğ  | À  | §  | í  | H  | ˙  |
| 08 | ■  | ↑  | (  | 8  | H  | X  | h  | x  | é  | î  | ñ  | §  | ⌘  | ⌘  | h  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | ö  | ñ  | ⌘  | ⌘  | ⌘  | ú  | ˆ  |
| 0A | ■  | →  | *  | :  | J  | Z  | j  | z  | è  | ù  |    | ⌘  | ⌘  | ⌘  | û  | ˙  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | ğ  | ½  | ⌘  | ⌘  | ⌘  | û  |    |
| 0C | ♀  | ⌘  | ,  | <  | L  | \  | l  |    | î  | £  | ſ  | ⌘  | ⌘  | ⌘  | ü  | ³  |
| 0D | ♪  | ↔  | -  | =  | M  | ]  | m  | }  | ï  | ê  | ş  | z  | =  |    | ü  | ²  |
| 0E | ♫  | ▲  | .  | >  | N  | ^  | n  | ~  | Ä  | ×  | «  | z  | ⌘  | ⌘  |    | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | _  | o  | û  | ç  | ſ  | »  | ⌘  | ⌘  | ⌘  | ,  |    |

# CP 855 (Russian)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 0  | ▶  |    | 0  | @  | P  | `  | p  | ђ  | љ  | a  |    | Л  | л  | Я  | -  |
| 01 | ⊕  | ◀  | !  | 1  | A  | Q  | a  | q  | ѣ  | ѡ  | A  |    | ⊥  | Л  | р  | ы  |
| 02 | ⊙  | †  | "  | 2  | B  | R  | b  | r  | ѓ  | њ  | б  |    | Т  | м  | Р  | ь  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | ѓ  | ѣ  | Б  |    | ┌  | М  | с  | э  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ё  | ђ  | ц  | └  | -  | н  | С  | З  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | ѣ  | ђ  | Ц  | х  | └  | Н  | т  | ш  |
| 06 | ♠  | -  | &  | 6  | F  | V  | f  | v  | є  | ќ  | д  | Х  | к  | о  | Т  | ш  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | Є  | ќ  | Д  | и  | К  | О  | у  | э  |
| 08 | ▣  | ↑  | (  | 8  | H  | X  | h  | x  | ѕ  | ѣ  | е  | И  | ѣ  | п  | У  | Э  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | Ѕ  | ѣ  | Е  | ђ  | Г  | Ј  | ж  | щ  |
| 0A | ▣  | →  | *  | :  | J  | Z  | j  | z  | і  | ѣ  | Ф  |    | ⊥  | Г  | Ж  | Щ  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | І  | Ц  | Ф  | ђ  | Т  | ■  | В  | Ч  |
| 0C | ♀  | └  | ,  | <  | L  | \  | l  |    | ї  | ю  | Г  | Ј  | ђ  | ■  | В  | Ч  |
| 0D | ♪  | ↔  | -  | =  | M  | ]  | m  | }  | Ї  | Ю  | Г  | ђ  | =  | П  | ь  |    |
| 0E | ♠  | ▲  | .  | >  | N  | ^  | n  | ~  | ј  | ѣ  | «  | И  | ђ  | я  | ѣ  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | _  | o  | ◊  | Ј  | ѣ  | »  | Г  | ѣ  | ■  | №  |    |

## CP 858 (Euro PC Multilingual)

|   | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0  |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| 0 |    | 0  | @  | P  | `  | p  | Ç  | É  | á  | ⌘  | Ł  | đ  | Ó  | -   |
| 1 | !  | 1  | A  | Q  | a  | q  | ù  | æ  | í  | ⌘  | Ł  | Đ  | ß  | ±   |
| 2 | "  | 2  | B  | R  | b  | r  | é  | Æ  | ó  | ■  | Ť  | Ě  | Ö  | -   |
| 3 | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    | Ť  | Ě  | Ò  | ¾   |
| 4 | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | Ť  | -  | Ě  | õ  | ¶   |
| 5 | %  | 5  | E  | U  | e  | u  | à  | ò  | Ñ  | Á  | †  | €  | Õ  | §   |
| 6 | &  | 6  | F  | V  | f  | v  | â  | û  | ä  | Ä  | ä  | í  | μ  | ÷   |
| 7 | '  | 7  | G  | W  | g  | w  | ç  | ù  | ó  | À  | Ä  | î  | þ  | ¸   |
| 8 | (  | 8  | H  | X  | h  | x  | ê  | ÿ  | ı  | ©  | Ł  | İ  | þ  | °   |
| 9 | )  | 9  | I  | Y  | i  | y  | ë  | Ö  | ®  | Ť  | Ť  | Ť  | Ú  | ... |
| A | *  | :  | J  | Z  | j  | z  | è  | Ü  | ˆ  |    | Ł  | Ť  | Û  | ·   |
| B | +  | ;  | K  | [  | k  | {  | ï  | ø  | ½  | Ť  | Ť  | ■  | Ü  | ¹   |
| C | ,  | <  | L  | \  | l  |    | î  | £  | ¼  | Ť  | Ť  | ■  | Ý  | ³   |
| D | -  | =  | M  | ]  | m  | }  | ì  | Ø  | ı  | ç  | =  | :  | Ÿ  | ²   |
| E | .  | >  | N  | ^  | n  | ~  | Ä  | ×  | «  | ¥  | Ť  | İ  | -  | •   |
| F | /  | ?  | O  | _  | o  |    | Å  | f  | »  | Ť  | ×  | ■  |    |     |

# CP 860 (Portugal)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 0  | ►  |    | 0  | @  | P  | `  | p  | Ç  | É  | Á  | ␣  | ␣  | ␣  | α  | ≡  |
| 01 | ⊕  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | À  | Í  | ␣  | ␣  | ␣  | β  | ±  |
| 02 | ⊙  | ↑  | "  | 2  | B  | R  | b  | r  | é  | Ê  | Ó  | ␣  | ␣  | ␣  | Γ  | ≥  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    |    | ␣  | π  | ≤  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ã  | õ  | ñ  |    | —  | ␣  | Σ  | ∫  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | ñ  | ‡  | †  | ␣  | σ  | ∫  |
| 06 | ♠  | _  | &  | 6  | F  | V  | f  | v  | Á  | Ú  | ä  | ‡  | ‡  | ␣  | μ  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | ç  | ù  | º  | ‡  | ‡  | ‡  | τ  | ≈  |
| 08 | ■  | ↑  | (  | 8  | H  | X  | h  | x  | ê  | î  | ¿  | ‡  | ␣  | ‡  | Φ  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | ê  | ö  | ò  | ‡  | ␣  | ␣  | Θ  | •  |
| 0A | ⊗  | →  | *  | :  | J  | Z  | j  | z  | è  | ü  | ¬  | ‡  | ␣  | ␣  | Ω  | •  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | í  | ç  | ½  | ‡  | ␣  | ■  | δ  | √  |
| 0C | ♀  | ␣  | ,  | <  | L  | \  | l  |    | ô  | £  | ¼  | ‡  | ‡  | ■  | ∞  | n  |
| 0D | ♫  | ↔  | —  | =  | M  | ]  | m  | }  | ì  | û  | ;  | ‡  | =  | ■  | ø  | ²  |
| 0E | ♫  | ▲  | .  | >  | N  | ^  | n  | ~  | Ã  | Ð  | «  | ‡  | ‡  | ■  | ε  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | —  | o  | ô  | Â  | ó  | »  | ‡  | ␣  | ■  | ∩  |    |

# CP 863 (Canada/France)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | ø  | ►  |    | 0  | @  | P  | `  | p  | Ç  | É  | !  | ⋮  | ⊥  | ⊥  | α  | ≡  |
| 01 | ☺  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | È  | ˆ  | ⋮  | ⊥  | ⊥  | β  | ±  |
| 02 | ☉  | ↑  | "  | 2  | B  | R  | b  | r  | é  | Ê  | ó  | ⋮  | ⊥  | ⊥  | Γ  | ≥  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    | ⊥  | ⊥  | π  | ≤  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | À  | Ë  | ˝  | ⊥  | —  | ⊥  | Σ  | ∫  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | Ï  | ,  | ⊥  | ⊥  | ⊥  | σ  | ∫  |
| 06 | ♠  | -  | &  | 6  | F  | V  | f  | v  | ¶  | û  | ˆ  | ⊥  | ⊥  | ⊥  | μ  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | ç  | ù  | -  | ⊥  | ⊥  | ⊥  | τ  | ≈  |
| 08 | ■  | ↑  | (  | 8  | H  | X  | h  | x  | ê  | œ  | î  | ⊥  | ⊥  | ⊥  | Φ  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | ô  | ı  | ⊥  | ⊥  | ⊥  | Θ  | •  |
| 0A | ▣  | →  | *  | :  | J  | Z  | j  | z  | è  | Ù  | ı  | ⊥  | ⊥  | ⊥  | Ω  | •  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | Ç  | ½  | ⊥  | ⊥  | ■  | δ  | √  |
| 0C | ♀  | ⊥  | ,  | <  | L  | \  | l  |    | î  | £  | ¾  | ⊥  | ⊥  | ■  | ∞  | n  |
| 0D | ♫  | ↔  | -  | =  | M  | ]  | m  | }  | =  | Û  | ¾  | ⊥  | =  | ■  | ∅  | ²  |
| 0E | ♫  | ▲  | .  | >  | N  | ^  | n  | ~  | À  | Û  | «  | ⊥  | ⊥  | ■  | ε  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | —  | o  | ◊  | §  | ƒ  | »  | ⊥  | ⊥  | ■  | ∩  |    |

# CP 864 (Arabic)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 0  | ▶  |    | 0  | @  | P  | `  | p  | °  | β  |    | •  | ¢  | ذ  | —  | ع  |
| 01 | ⊕  | ◀  | !  | 1  | A  | Q  | a  | q  | •  | ∞  | —  | ١  | ٢  | ر  | ف  | هـ |
| 02 | ♪  | ↑  | "  | 2  | B  | R  | b  | r  | •  | ∅  | ٢  | ٣  | ٤  | ز  | ق  | ن  |
| 03 | ♫  | !! | #  | 3  | C  | S  | c  | s  | √  | ±  | £  | ٣  | ٤  | س  | ك  | م  |
| 04 | ✱  | ¶  | \$ | 4  | D  | T  | d  | t  | ⋮  | ½  | ¤  | £  | و  | ش  | ل  | ر  |
| 05 | =  | §  | %  | 5  | E  | U  | e  | u  | —  | ¼  | ٢  | ٥  | ع  | م  | م  | ي  |
| 06 |    | -  | &  | 6  | F  | V  | f  | v  |    | ≈  |    | ٦  | ٧  | ض  | ن  | ي  |
| 07 | ‡  | ‡  | '  | 7  | G  | W  | g  | w  | +  | «  |    | ٧  | ٨  | ط  | هـ | غ  |
| 08 | ‡  | ‡  | (  | 8  | H  | X  | h  | x  | +  | »  | ٨  | ٩  | ب  | ظ  | و  | ق  |
| 09 | ‡  | ‡  | )  | 9  | I  | Y  | i  | y  | ‡  | لا | ب  | ٩  | ة  | ع  | ي  | لا |
| 0A | ‡  | →  | *  | :  | J  | Z  | j  | z  | ‡  | لا | ت  | ف  | ت  | ع  | ب  | لا |
| 0B | ‡  | ←  | +  | ;  | K  | [  | k  | {  | ‡  |    | ث  | ١  | ث  | ا  | ض  | ل  |
| 0C | ‡  | ‡  | ,  | <  | L  | \  | l  |    | ‡  |    | ،  | س  | ج  | ر  | ك  | ك  |
| 0D | ‡  | ↔  | -  | =  | M  | ]  | m  | }  | ‡  | لا | ح  | ش  | ح  | ÷  | غ  | ي  |
| 0E | ‡  | ▲  | .  | >  | N  | ^  | n  | ~  | ‡  | لا | ح  | ص  | خ  | x  | غ  | ■  |
| 0F | ‡  | ▼  | /  | ?  | O  | _  | o  | ⌋  | ‡  | ،  | خ  | ؟  | د  | ع  | م  |    |

## CP 864E (Arabic)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90  | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|-----|----|----|----|----|----|----|
| 00 | Ø  | ►  |    | 0  | @  | P  | `  | p  | °  | /   |    | •  | ¢  | د  | —  | ـ  |
| 01 | ⊕  | ◄  | !  | 1  | A  | Q  | a  | q  | •  | ∞   | —  | ۱  | ء  | ر  | ف  | ـ  |
| 02 | ⊗  | ↑  | "  | 2  | B  | R  | b  | r  | •  | •   | ل  | ۲  | ٲ  | ز  | ق  | ن  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | √  | ±   | £  | ۳  | ٲ  | س  | ك  | هـ |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ≡  | ½   | ¤  | £  | و  | ش  | ل  | ر  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | —  | ¼   | ℓ  | هـ | ع  | ص  | م  | ى  |
| 06 | ♠  | —  | &  | 6  | F  | V  | f  | v  | ⇒  | ≈   | ٲ  | ٲ  | ث  | ض  | ن  | ي  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | —  | ئ   | ل  | ٲ  | ٲ  | ط  | هـ | ف  |
| 08 | ■  | †  | (  | 8  | H  | X  | h  | x  | —  | ئ   | ل  | ٲ  | ٲ  | ظ  | و  | ق  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | —  | لا  | ٲ  | ٲ  | ة  | ع  | ى  | لا |
| 0A | ■  | →  | *  | :  | J  | Z  | j  | z  | —  | لا  | ت  | ف  | ت  | ع  | ٲ  | لا |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | =  | لام | ث  | ؛  | ث  | ا  | ض  | ل  |
| 0C | ♀  | ⌊  | ,  | <  | L  | \  | l  |    | "  | لام | ،  | س  | ج  | ٲ  | ع  | ك  |
| 0D | ♪  | ↔  | —  | =  | M  | ]  | m  | }  | =  | لا  | ح  | ش  | ح  | ÷  | غ  | ي  |
| 0E | ♂  | ▲  | .  | >  | N  | ^  | n  | ~  | /  | لا  | ح  | ص  | خ  | ×  | غ  | ك  |
| 0F | ✱  | ▼  | /  | ?  | O  | —  | o  | ⊕  | ,  | و   | خ  | ?  | د  | ع  | م  |    |

# CP 865 (Denmark/Norway)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | ø  | ►  |    | 0  | @  | P  | `  | p  | Ç  | É  | á  | ⋮  | ⊥  | ⊥  | α  | ≡  |
| 01 | ☺  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | æ  | í  | ⋮  | ⊥  | ⊥  | β  | ±  |
| 02 | ☹  | ↑  | "  | 2  | B  | R  | b  | r  | é  | Æ  | ó  | ⋮  | ⊥  | ⊥  | Γ  | ≥  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    | ⊥  | ⊥  | π  | ≤  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | ⊥  | —  | ⊥  | Σ  | ∫  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | Ñ  | ⊥  | ⊥  | ⊥  | σ  | ∫  |
| 06 | ♠  | —  | &  | 6  | F  | V  | f  | v  | á  | û  | æ  | ⊥  | ⊥  | ⊥  | μ  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | ç  | ù  | º  | ⊥  | ⊥  | ⊥  | τ  | ≈  |
| 08 | ■  | ↑  | (  | 8  | H  | X  | h  | x  | ê  | ÿ  | ¿  | ⊥  | ⊥  | ⊥  | Φ  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | Ö  | ¬  | ⊥  | ⊥  | ⊥  | Θ  | •  |
| 0A | ▣  | →  | *  | :  | J  | Z  | j  | z  | è  | Ü  | ¬  | ⊥  | ⊥  | ⊥  | Ω  | •  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | ø  | ½  | ⊥  | ⊥  | ■  | δ  | √  |
| 0C | ♀  | ⊥  | ,  | <  | L  | \  | l  |    | í  | £  | ¼  | ⊥  | ⊥  | ■  | ∞  | n  |
| 0D | ♪  | ↔  | —  | =  | M  | ]  | m  | }  | ì  | Ø  | ¡  | ⊥  | =  | ■  | ∅  | ²  |
| 0E | ♫  | ▲  | .  | >  | N  | ^  | n  | ~  | Ä  | Ð  | «  | ⊥  | ⊥  | ■  | ε  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | —  | o  | △  | Å  | ƒ  | ¤  | ⊥  | ⊥  | ■  | ∩  |    |

# CP 866 (Cyrillic)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 0  | ▶  |    | 0  | @  | P  | `  | p  | A  | P  | a  | ␣  | ␣  | ␣  | p  | Ё  |
| 01 | ⊕  | ◀  | !  | 1  | A  | Q  | a  | q  | Б  | С  | б  | ␣  | ␣  | ␣  | с  | ё  |
| 02 | ⊗  | ↑  | "  | 2  | B  | R  | b  | r  | В  | Т  | в  | ␣  | ␣  | ␣  | т  | ѐ  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | Г  | У  | г  |    |    | ␣  | у  | е  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | Д  | Ф  | д  | †  | —  | ␣  | ф  | ѝ  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | Е  | Х  | е  | ‡  | †  | ␣  | х  | ї  |
| 06 | ♠  | -  | &  | 6  | F  | V  | f  | v  | Ж  | Ц  | ж  | ‡  | ‡  | ␣  | ц  | џ  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | З  | Ч  | з  | ‡  | ‡  | ‡  | ч  | ѣ  |
| 08 | ▣  | ↑  | (  | 8  | H  | X  | h  | x  | И  | Ш  | и  | ‡  | ␣  | ‡  | ш  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | Й  | Щ  | й  | ‡  | ␣  | ␣  | щ  | •  |
| 0A | ▣  | →  | *  | :  | J  | Z  | j  | z  | К  | Ъ  | к  | ‡  | ␣  | ␣  | ъ  | ·  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | Л  | Ы  | л  | ‡  | ␣  | ␣  | ы  | √  |
| 0C | ♀  | ␣  | ,  | <  | L  | \  | l  |    | М  | Ь  | м  | ‡  | ‡  | ␣  | ь  | №  |
| 0D | ♂  | ↔  | -  | =  | M  | ]  | m  | }  | Н  | Э  | н  | ‡  | =  | ␣  | э  | ¤  |
| 0E | ♂  | ▲  | .  | >  | N  | ^  | n  | ~  | О  | Ю  | о  | ‡  | ‡  | ␣  | ю  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | _  | o  | ␣  | П  | Я  | п  | ‡  | ␣  | ␣  | я  |    |

## CP 867 (Turkish 2)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | ø  | ►  |    | 0  | @  | P  | `  | p  | Ç  | É  | á  | ☐  | ⊥  | ø  | ó  | —  |
| 01 | ⊕  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | æ  | ı  | ☐  | ⊥  | æ  | ß  | ±  |
| 02 | ⊗  | ↑  | "  | 2  | B  | R  | b  | r  | é  | Æ  | ó  | ☐  | ⊥  | Æ  | ô  |    |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    | ⊥  | Æ  | ò  | ¼  |
| 04 | ♦  | Π  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | ⊥  | —  | Æ  | ö  | Π  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | Ñ  | À  | †  |    | Ö  | §  |
| 06 | ♠  | -  | &  | 6  | F  | V  | f  | v  | a  | û  | Ğ  | Â  | ã  | ı  | μ  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | ç  | ù  | ğ  | À  | Ã  | ı  |    | ,  |
| 08 | ■  | †  | (  | 8  | H  | X  | h  | x  | ê  | ı  | ¿  | ●  | ⊥  | ı  | ×  | °  |
| 09 | ○  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | ö  | ●  | ‡  | ⊥  | ı  | ó  | .. |
| 0A | ◼  | →  | *  | :  | J  | Z  | j  | z  | è  | ù  | ¬  |    | ⊥  | ⊥  | ó  | •  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | ø  | ½  | ⊥  | ⊥  | ■  | ó  | 1  |
| 0C | ♀  | ⊥  | ,  | <  | L  | \  | l  |    | î  | £  | ¼  | ⊥  | ⊥  | ■  | ı  | 3  |
| 0D | ♂  | ↔  | -  | =  | M  | ]  | m  | }  | ı  | ø  | ı  | Ç  | =  | ı  | ÿ  | 2  |
| 0E | ♂  | ▲  | .  | >  | N  | ^  | n  | ~  | À  | Ş  | «  | ¥  | ⊥  | ı  | -  | ■  |
| 0F | ☼  | ▼  | /  | ?  | O  | _  | o  | û  | À  | ş  | »  | ⊥  | ¤  | ■  | '  |    |

# Mazowia (Polish)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 0  | ►  |    | 0  | @  | P  | `  | p  | Ç  | Ɛ  | z  | ⌘  | ⌘  | ⌘  | α  | ≡  |
| 01 | ⊕  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | ę  | z  | ⌘  | ⌘  | ⌘  | β  | ±  |
| 02 | ⊕  | ↑  | "  | 2  | B  | R  | b  | r  | é  | ł  | ó  | ⌘  | ⌘  | ⌘  | Γ  | ≥  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ó  | ⌘  | ⌘  | ⌘  | π  | ≤  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | ⌘  | ⌘  | ⌘  | Σ  | ∫  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ć  | Ń  | ⌘  | ⌘  | ⌘  | σ  | ∫  |
| 06 | ♠  | -  | &  | 6  | F  | V  | f  | v  | ą  | û  | z  | ⌘  | ⌘  | ⌘  | μ  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | ç  | ù  | z  | ⌘  | ⌘  | ⌘  | τ  | ≈  |
| 08 | ▣  | †  | (  | 8  | H  | X  | h  | x  | ê  | ś  | ż  | ⌘  | ⌘  | ⌘  | Φ  | °  |
| 09 | ◊  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | ö  | ŕ  | ⌘  | ⌘  | ⌘  | Θ  | •  |
| 0A | ▣  | →  | *  | :  | J  | Z  | j  | z  | è  | ù  | ŕ  | ⌘  | ⌘  | ⌘  | Ω  | -  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | ś  | ½  | ⌘  | ⌘  | ⌘  | δ  | √  |
| 0C | ♀  | ⌞  | ,  | <  | L  | \  | l  |    | î  | Ł  | ¼  | ⌘  | ⌘  | ⌘  | ∞  | n  |
| 0D | ♪  | ↔  | -  | =  | M  | ]  | m  | }  | ć  | Ź  | ;  | ⌘  | ⌘  | ⌘  | ∅  | ²  |
| 0E | ♫  | ▲  | .  | >  | N  | ^  | n  | ~  | Å  | Ś  | «  | ⌘  | ⌘  | ⌘  | ε  | ■  |
| 0F | ✱  | ▼  | /  | ?  | O  | _  | o  | ô  | Ą  | ś  | »  | ⌘  | ⌘  | ⌘  | ∩  |    |

# Turkish

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | Ø  | ►  |    | 0  | @  | P  | `  | p  | Ç  | É  | Á  |    | Ł  | „  | α  | ≡  |
| 01 | ©  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | æ  | ı  |    | ±  | 〒  | β  | ±  |
| 02 | ®  | ↑  | "  | 2  | B  | R  | b  | r  | é  | Æ  | ó  |    | 〒  | 〒  | Γ  | ≥  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    | †  | „  | π  | ≤  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | †  | —  | Ł  | Σ  | ∫  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | ñ  | ‡  | †  | ƒ  | σ  | ∫  |
| 06 | ♠  | —  | &  | 6  | F  | V  | f  | v  | a  | û  | č  | ‡  | †  | ƒ  | μ  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | ç  | ù  | ğ  | ‡  | †  | †  | τ  | ≈  |
| 08 | ▣  | ↑  | (  | 8  | H  | X  | h  | x  | ê  | ı  | ¿  | ‡  | Ł  | †  | Φ  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | ö  | ı  | ‡  | ƒ  | ƒ  | Θ  | •  |
| 0A | ▣  | →  | *  | :  | J  | Z  | j  | z  | è  | ü  | ı  | ‡  | Ł  | ƒ  | Ω  | •  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | ç  | ½  | ‡  | 〒  | ■  | δ  | √  |
| 0C | ♀  | ↳  | ,  | <  | L  | \  | l  |    | î  | £  | ¼  | ‡  | ‡  | ■  | ∞  | n  |
| 0D | ♂  | ↔  | —  | =  | M  | ]  | m  | }  | ı  | ¥  | ı  | ‡  | =  | ■  | ∅  | ²  |
| 0E | ♂  | ▲  | .  | >  | N  | ^  | n  | ~  | Ä  | Ş  | «  | ‡  | ‡  | ■  | ε  | ■  |
| 0F | ⊗  | ▼  | /  | ?  | O  | _  | o  | ô  | Å  | Ş  | »  | ‡  | ±  | ■  | ∩  |    |

# Greek

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | 0  | ►  |    | 0  | @  | P  | `  | p  | A  | P  | ι  | ⋮  | ι  | ⊥  | ω  | Ω  |
| 01 | ⊕  | ◄  | !  | 1  | A  | Q  | a  | q  | B  | Σ  | κ  | ⋮  | ⊥  | ⌒  | α  | ±  |
| 02 | ⊗  | ↑  | "  | 2  | B  | R  | b  | r  | Γ  | T  | λ  | ⋮  | ⌒  | ⌒  | ε  | ≥  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | Δ  | Υ  | μ  |    | ⌒  | ⊥  | η  | ≤  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | E  | Φ  | ν  | ⌒  | —  | ⊥  | ι  | ∫  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | Z  | X  | ξ  | ⌒  | ⌒  | ⌒  | ι  | J  |
| 06 | ♠  | —  | &  | 6  | F  | V  | f  | v  | H  | Ψ  | ο  | ⌒  | ⌒  | ⌒  | ο  | ÷  |
| 07 | •  | ‡  | '  | 7  | G  | W  | g  | w  | Θ  | Ω  | π  | ⌒  | ⌒  | ⌒  | ύ  | ≈  |
| 08 | ■  | ↑  | (  | 8  | H  | X  | h  | x  | I  | α  | ρ  | ⌒  | ⊥  | ⊥  | ü  | °  |
| 09 | ◦  | ↓  | )  | 9  | I  | Y  | i  | y  | K  | β  | σ  | ⌒  | ⌒  | ⌒  | ώ  | £  |
| 0A | ▣  | →  | *  | :  | J  | Z  | j  | z  | Λ  | γ  | ς  | ⌒  | ⊥  | ⌒  | Α  | ¥  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | M  | δ  | τ  | ⌒  | ⌒  | ■  | Ε  | √  |
| 0C | ♀  | ⌒  | ,  | <  | L  | \  | l  |    | N  | ε  | υ  | ⌒  | ⌒  | ■  | Η  | η  |
| 0D | ♂  | ↔  | —  | =  | M  | ]  | m  | }  | Ξ  | ζ  | φ  | ⌒  | =  | ⌒  | Ι  | ²  |
| 0E | ♂  | ▲  | .  | >  | N  | ^  | n  | ~  | O  | η  | χ  | ⌒  | ⌒  | ⌒  | Ο  | ■  |
| 0F | ⊗  | ▼  | /  | ?  | O  | —  | ο  | ⊔  | Π  | Θ  | ψ  | ⌒  | ⊥  | ■  | Υ  |    |

# Kamenicky

|    | 00  | 10  | 20 | 30 | 40 | 50 | 60 | 70  | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|-----|-----|----|----|----|----|----|-----|----|----|----|----|----|----|----|----|
| 00 | NUL |     | SP | 0  | @  | P  | `  | p   | Č  | Ě  | á  | ▤  | ⊥  | ⊥  | α  | ≡  |
| 01 |     | DC1 | !  | 1  | A  | Q  | a  | q   | ü  | ž  | í  | ▥  | ⊥  | ⊥  | β  | ±  |
| 02 |     |     | "  | 2  | B  | R  | b  | r   | é  | ž  | ó  | ▦  | ⊥  | ⊥  | Γ  | ≥  |
| 03 | ETX | DC3 | #  | 3  | C  | S  | c  | s   | ď  | ô  | ú  |    | ⊥  | ⊥  | π  | ≤  |
| 04 |     |     | \$ | 4  | D  | T  | d  | t   | ä  | ö  | ň  | ⊥  | —  | ⊥  | Σ  | ∫  |
| 05 | ENQ | §   | %  | 5  | E  | U  | e  | u   | ď  | ó  | ň  | ⊥  | ⊥  | ⊥  | σ  | ∫  |
| 06 | ACK |     | &  | 6  | F  | V  | f  | v   | ř  | ů  | ů  | ⊥  | ⊥  | ⊥  | μ  | ÷  |
| 07 | BEL |     | '  | 7  | G  | W  | g  | w   | č  | ú  | ô  | ⊥  | ⊥  | ⊥  | τ  | ≈  |
| 08 | BS  |     | (  | 8  | H  | X  | h  | x   | ě  | ý  | š  | ⊥  | ⊥  | ⊥  | Φ  | °  |
| 09 | HT  |     | )  | 9  | I  | Y  | i  | y   | ě  | ö  | ř  | ⊥  | ⊥  | ⊥  | Θ  | •  |
| 0A | LF  |     | *  | :  | J  | Z  | j  | z   | Ĺ  | Ů  | ř  | ⊥  | ⊥  | ⊥  | Ω  | •  |
| 0B | VT  | ESC | +  | ;  | K  | [  | k  | {   | í  | š  | ř  | ⊥  | ⊥  | ▀  | δ  | √  |
| 0C | FF  |     | ,  | <  | L  | \  | l  |     | l' | Ĺ  | ¼  | ⊥  | ⊥  | ▀  | ∞  | n  |
| 0D | CR  |     | -  | =  | M  | ]  | m  | }   | l' | Ÿ  | ;  | ⊥  | =  | ▀  | ∅  | ²  |
| 0E | SO  |     | .  | >  | N  | ^  | n  | ~   | Ā  | Ř  | «  | ⊥  | ⊥  | ▀  | ε  | ▪  |
| 0F | SI  |     | /  | ?  | O  | _  | o  | DEL | Á  | Ě  | »  | ⊥  | ⊥  | ▀  | ∩  |    |

|    | 00  | 10  | 20 | 30 | 40 | 50 | 60 | 70  | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|-----|-----|----|----|----|----|----|-----|----|----|----|----|----|----|----|----|
| 00 | NUL |     | SP | 0  | @  | P  | `  | p   | Ç  | é  | á  | ␣  | ␣  | ␣  | α  | ≡  |
| 01 |     | DC1 | !  | 1  | A  | Q  | a  | q   | ü  | æ  | í  | ␣  | ␣  | ␣  | β  | ±  |
| 02 |     |     | "  | 2  | B  | R  | b  | r   | é  | Æ  | ó  | ␣  | ␣  | ␣  | Γ  | ≥  |
| 03 | ETX | DC3 | #  | 3  | C  | S  | c  | s   | â  | ö  | ú  |    |    | ␣  | π  | ≤  |
| 04 |     |     | \$ | 4  | D  | T  | d  | t   | ä  | ö  | ñ  |    | —  | ␣  | Σ  | ∫  |
| 05 | ENQ | §   | %  | 5  | E  | U  | e  | u   | à  | ó  | Ñ  | ␣  | ␣  | ␣  | σ  | ∫  |
| 06 | ACK |     | &  | 6  | F  | V  | f  | v   | ä  | ü  | æ  | ␣  | ␣  | ␣  | μ  | ÷  |
| 07 | BEL |     | '  | 7  | G  | W  | g  | w   | ç  | ú  | ö  | ␣  | ␣  | ␣  | τ  | ≈  |
| 08 | BS  |     | (  | 8  | H  | X  | h  | x   | ê  | ú  | ¿  | ␣  | ␣  | ␣  | Φ  | °  |
| 09 | HT  |     | )  | 9  | I  | Y  | i  | y   | ë  | ö  | ␣  | ␣  | ␣  | ␣  | Θ  | •  |
| 0A | LF  |     | *  | :  | J  | Z  | j  | z   | è  | ü  | ␣  | ␣  | ␣  | ␣  | Ω  | •  |
| 0B | VT  | ESC | +  | ;  | K  | [  | k  | {   | ï  | ç  | ½  | ␣  | ␣  | ␣  | δ  | √  |
| 0C | FF  |     | ,  | <  | L  | \  | l  |     | î  | £  | ¼  | ␣  | ␣  | ␣  | ∞  | n  |
| 0D | CR  |     | -  | =  | M  | ]  | m  | }   | í  | ¥  | ;  | ␣  | =  | ␣  | ∅  | ²  |
| 0E | SO  |     | .  | >  | N  | ^  | n  | ~   | À  | £  | «  | ␣  | ␣  | ␣  | ε  | ■  |
| 0F | SI  |     | /  | ?  | O  | _  | o  | DEL | Á  | ƒ  | »  | ␣  | ␣  | ␣  | ∩  |    |

## Roman-8

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | — | â | Å | Á | Þ |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   | À | Ý | ê | î | Ã | þ |
| 2 |   |   | "  | 2 | B | R | b | r |   |   | Â | Ÿ | ô | ø | ã | • |
| 3 |   |   | #  | 3 | C | S | c | s |   |   | È | ° | û | Æ | Ð | μ |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | Ê | Ç | á | å | ö | ¶ |
| 5 |   |   | %  | 5 | E | U | e | u |   |   | Ë | ç | é | í | Í | ¾ |
| 6 |   |   | &  | 6 | F | V | f | v |   |   | Î | Ñ | ó | ø | Ì | — |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | Ï | ñ | ú | æ | Ó | ¼ |
| 8 |   |   | (  | 8 | H | X | h | x |   |   | ´ | ı | à | Ä | Ò | ½ |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   | ˘ | ı | è | ì | Õ | ¾ |
| A |   |   | *  | : | J | Z | j | z |   |   | ˆ | ı | ò | Ö | õ | ◊ |
| B |   |   | +  | ; | K | [ | k | { |   |   | ˙ | £ | ù | Û | Š | « |
| C |   |   | ,  | < | L | \ | l |   |   |   | ˜ | ¥ | ä | É | š | ■ |
| D |   |   | -  | = | M | ] | m | } |   |   | Û | § | ë | ï | Ú | » |
| E |   |   | .  | > | N | ^ | n | ˘ |   |   | Û | f | ö | ß | Ÿ | ± |
| F |   |   | /  | ? | O | _ | o | ⌘ |   |   | £ | ç | ü | Ô | ŷ |   |

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 | ø  | ►  |    | 0  | @  | P  | `  | p  | Ç  | É  | á  | ⌘  | Ⓕ  | ð  | Ó  | -  |
| 01 | ☺  | ◄  | !  | 1  | A  | Q  | a  | q  | ü  | æ  | í  | ⌘  | Ⓕ  | Ð  | ß  | ±  |
| 02 | ☹  | ↑  | "  | 2  | B  | R  | b  | r  | é  | Æ  | ó  | ■  | Ⓕ  | Ê  | Ô  | —  |
| 03 | ♥  | !! | #  | 3  | C  | S  | c  | s  | â  | ô  | ú  |    | Ⓕ  | Ë  | Ò  | ¾  |
| 04 | ♦  | ¶  | \$ | 4  | D  | T  | d  | t  | ä  | ö  | ñ  | Ⓕ  | —  | È  | õ  | ¶  |
| 05 | ♣  | §  | %  | 5  | E  | U  | e  | u  | à  | ò  | Ñ  | Á  | †  | ı  | Ö  | §  |
| 06 | ♠  | _  | &  | 6  | F  | V  | f  | v  | â  | û  | æ  | Â  | ä  | í  | μ  | ÷  |
| 07 | •  | ±  | '  | 7  | G  | W  | g  | w  | ç  | ù  | œ  | À  | Ã  | î  | þ  | ˙  |
| 08 | ■  | ↑  | (  | 8  | H  | X  | h  | x  | ê  | ÿ  | ı  | ©  | Ⓕ  | Ï  | Þ  | °  |
| 09 | ○  | ↓  | )  | 9  | I  | Y  | i  | y  | ë  | Ö  | ©  | Ⓕ  | Ⓕ  | Ⓕ  | Ú  | ˆ  |
| 0A | ◻  | →  | *  | :  | J  | Z  | j  | z  | è  | Ü  | ˘  | Ⓕ  | Ⓕ  | Ⓕ  | Û  | ˙  |
| 0B | ♂  | ←  | +  | ;  | K  | [  | k  | {  | ï  | ø  | ½  | Ⓕ  | Ⓕ  | ■  | Ü  | 1  |
| 0C | ♀  | Ⓕ  | ,  | <  | L  | \  | l  |    | í  | £  | ¼  | Ⓕ  | Ⓕ  | ■  | Ý  | 3  |
| 0D | ♪  | ↔  | -  | =  | M  | ]  | m  | }  | ì  | Ø  | ı  | c  | =  | :  | Ÿ  | 2  |
| 0E | 🎵  | ▲  | .  | >  | N  | ˘  | n  | ˘  | Ä  | ×  | «  | ¥  | †  | ì  | ˘  | •  |
| 0F | ⚙  | ▼  | /  | ?  | O  | _  | o  | △  | Å  | f  | »  | Ⓕ  | Ⓕ  | ■  | ˘  |    |

# ISO 8859-1 (USA/Western Europe)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  | `  | p  |    |    |    | °  | À  | Ð  | à  | ð  |
| 01 |    |    | !  | 1  | A  | Q  | a  | q  |    |    | ;  | ±  | Á  | Ñ  | á  | ñ  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    | ç  | ²  | Â  | Ò  | â  | ò  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    | £  | ³  | Ã  | Ó  | ã  | ó  |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | ¤  | ´  | Ä  | Ô  | ä  | ô  |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    | ¥  | µ  | Å  | Ö  | å  | ö  |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    |    |    | Æ  | Ø  | æ  | ø  |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    | §  | •  | Ç  | ×  | ç  | ÷  |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    |    |    | È  | Ø  | è  | ø  |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    | •  | ¹  | É  | Ù  | é  | ù  |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    | ª  | º  | Ê  | Ú  | ê  | ú  |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    | «  | »  | Ë  | Û  | ë  | û  |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    | ¬  | ¼  | Ì  | Ü  | ì  | ü  |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    |    | ½  | Í  | Ý  | í  | ý  |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    | •  | ¾  | Î  | Þ  | î  | þ  |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    |    |    | Ï  | ß  | ï  | ÿ  |

## ISO 8859-2 (Eastern Europe)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  | `  | p  |    |    |    | °  | Ř  | Đ  | ř  | ď  |
| 01 |    |    | !  | 1  | A  | Q  | a  | q  |    |    | Ā  | ā  | Á  | Ń  | á  | ń  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    | ˘  | ˙  | Â  | Ň  | â  | ň  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    | Ł  | ł  | Å  | Ó  | ă  | ó  |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | ǫ  | ´  | Ǻ  | Ô  | ä  | ô  |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    | Ĺ  | ĺ  | Ľ  | Ö  | ı  | ö  |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    | Š  | š  | Č  | Ö  | č  | ö  |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    | Ş  | ˘  | Ç  | ×  | ç  | ÷  |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    | ˝  | ˙  | Č  | Ř  | č  | ř  |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    | Š  | š  | É  | Ů  | é  | ů  |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    | Ş  | ş  | È  | Ú  | è  | ú  |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    | ř  | č  | Ě  | Ú  | ě  | ú  |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    | ž  | ž  | Ě  | Ú  | ě  | ü  |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    | -  | ˝  | ı  | Ý  | ı  | ý  |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    | ž  | ž  | ı  | Ť  | ı  | ť  |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    | ž  | ž  | Đ  | ß  | đ  | ˘  |

## ISO 8859-3 (Southern Europe)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  | `  | p  |    |    |    | °  | À  |    | à  |    |
| 01 |    |    | !  | 1  | A  | Q  | a  | q  |    |    | Ë  | ë  | Á  | Ñ  | á  | ñ  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    | ˘  | ²  | Â  | Ò  | â  | ò  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    | £  | ³  |    | Ó  |    | ó  |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | ¤  | ´  | Å  | Ö  | ä  | ö  |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    |    | µ  | Č  | Ğ  | č  | ğ  |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    | ₤  | ñ  | Ć  | Ö  | ć  | ö  |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    | §  | •  | Ç  | ×  | ç  | ÷  |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    | ¨  | ,  | È  | Ğ  | è  | ğ  |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    | ı  | ı  | É  | Û  | é  | ù  |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    | Ş  | ş  | Ê  | Û  | ê  | ú  |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    | č  | ğ  | Ě  | Û  | ě  | û  |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    | Ÿ  | Ÿ  | İ  | Û  | ı  | ü  |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    | -  | ½  | İ  | Û  | ı  | ü  |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    |    |    | İ  | Š  | ı  | š  |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    | Ž  | ž  | İ  | ß  | ı  | ·  |

# ISO 8859-4 (Northern Europe)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  | `  | p  |    |    |    | °  | Å  | Đ  | ā  | đ  |
| 01 |    |    | !  | 1  | A  | Q  | a  | q  |    |    | Ā  | ą  | Ą  | Ń  | á  | ņ  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    | κ  | ˙  | Ā  | ō  | ā  | ō  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    | Ḃ  | ṛ  | Ā  | Ḳ  | ā  | ḵ  |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | ṽ  | ˘  | Ā  | ô  | ä  | ô  |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    | ī  | ī  | L  | ō  | ī  | ō  |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    | Ĳ  | ĳ  | Æ  | ö  | æ  | ö  |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    | Š  | ˘  | Ĳ  | ×  | ī  | ÷  |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    | ˝  | ˙  | č  | ø  | č  | ø  |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    | š  | š  | ē  | ū  | é  | ų  |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    | ē  | ē  | Ė  | ú  | ę  | ú  |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    | Ģ  | ģ  | Ē  | û  | ē  | û  |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    | Ṽ  | ṽ  | Ē  | ü  | è  | ü  |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    | -  | Ḍ  | ī  | Ů  | í  | ũ  |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    | ž  | ž  | ī  | Ů  | ī  | ũ  |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    | -  | ŋ  | ī  | ß  | ī  | ˘  |

## ISO 8859-5 (Cyrillic)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  | `  | p  |    |    |    | A  | P  | a  | p  | №  |
| 01 |    |    | !  | 1  | A  | Q  | a  | q  |    |    | Ђ  | Б  | С  | б  | с  | ё  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    | Ђ  | В  | Т  | в  | т  | ђ  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    | ѓ  | Г  | У  | г  | у  | ѓ  |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | Є  | Д  | Ф  | д  | ф  | є  |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    | Ѕ  | Е  | Х  | е  | х  | ѕ  |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    | І  | Ж  | Ц  | ж  | ц  | і  |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    | Ї  | З  | Ч  | з  | ч  | ї  |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    | Ј  | И  | Ш  | и  | ш  | ј  |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    | Љ  | Й  | Щ  | й  | щ  | љ  |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    | Њ  | К  | Ъ  | к  | ъ  | њ  |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    | Ћ  | Л  | Ы  | л  | ы  | ћ  |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    | Ќ  | М  | Ь  | м  | ь  | ќ  |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    | -  | Н  | Э  | н  | э  | Ѕ  |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    | У  | О  | Ю  | о  | ю  | џ  |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    | Ѣ  | П  | Я  | п  | я  | ѣ  |

# ISO 8859-6 (Arabic)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  | `  | p  |    |    |    |    |    | ذ  | ـ  |    |
| 01 |    |    | !  | 1  | A  | Q  | a  | q  |    |    |    |    |    | ر  | ف  | ع  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    |    |    |    | ز  | ق  | °  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    |    |    |    | س  | ك  |    |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | ڤ  |    |    | ش  | ل  |    |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    |    |    |    | ى  | م  |    |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    |    |    |    | غ  | ن  |    |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    |    |    |    | ط  | ه  |    |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    |    |    |    | ظ  | و  |    |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    |    |    |    | ع  | ى  |    |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    |    |    |    | ت  | ي  |    |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    |    |    |    | ث  | =  |    |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    |    |    |    | ج  | "  |    |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    |    |    |    | ح  |    |    |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    |    |    |    | خ  |    |    |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    |    |    |    | د  |    |    |

# ISO 8859-7 (Greek)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  |    | p  |    |    | °  | ı  | Π  | ϖ  | π  |    |
| 01 |    |    | !  | 1  | A  | Q  | a  | q  |    |    | `  | ±  | Α  | Ρ  | α  | ρ  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    | ´  | ²  | Β  |    | β  | ς  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    | £  | ³  | Γ  | Σ  | γ  | σ  |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | '  | Δ  | Τ  | δ  | τ  |    |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    | ¨  | Ε  | Υ  | ε  | υ  |    |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    |    | Α  | Ζ  | Φ  | ζ  | φ  |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    | §  | •  | Η  | Χ  | η  | χ  |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    | ¨  | Ε  | Θ  | Ψ  | θ  | ψ  |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    | •  | Η  | Ι  | Ω  | ι  | ω  |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    |    | Ι  | Κ  | Υ  | κ  | ι  |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    | «  | »  | Λ  | Υ  | λ  | υ  |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    | ¬  | Ο  | Μ  | Α  | μ  | ο  |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    | -  | ½  | Ν  | Ε  | ν  | ύ  |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    |    | Τ  | Ξ  | ή  | ξ  | ώ  |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    | -  | Ω  | Ο  | ι  | ο  |    |

# ISO 8859-8 (Hebrew)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  | `  | p  |    |    |    | °  |    |    | א  | נ  |
| 01 |    |    | !  | 1  | A  | Q  | a  | q  |    |    |    | ±  |    |    | ב  | ס  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    | ç  | ²  |    |    | ג  | ע  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    | £  | ³  |    |    | ד  | ה  |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | ¤  | ´  |    |    | ה  | פ  |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    | ¥  | µ  |    |    | ו  | ז  |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    |    | ¶  |    |    | ז  | צ  |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    | §  | •  |    |    | ח  | ק  |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    | ¨  | ,  |    |    | ט  | ך  |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    | ©  | ¹  |    |    | י  | ש  |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    | ×  | ÷  |    |    | ך  | ת  |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    | «  | »  |    |    | כ  |    |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    | ¬  | ¼  |    |    | ל  |    |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    | -  | ½  |    |    | ם  |    |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    | ®  | ¾  |    |    | מ  |    |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    | ¯  |    |    | =  | ן  |    |

## ISO 8859-9 (Western Europe 2)

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 00 |    |    |    | 0  | @  | P  | `  | p  |    |    |    | °  | À  | Š  | à  | š  |
| 01 |    |    | !  | 1  | À  | Q  | a  | q  |    |    | ;  | ±  | Á  | Ň  | á  | ň  |
| 02 |    |    | "  | 2  | B  | R  | b  | r  |    |    | ç  | ²  | Â  | ò  | â  | ò  |
| 03 |    |    | #  | 3  | C  | S  | c  | s  |    |    | £  | ³  | Ã  | ó  | ã  | ó  |
| 04 |    |    | \$ | 4  | D  | T  | d  | t  |    |    | ¤  | ´  | Ä  | ô  | ä  | ô  |
| 05 |    |    | %  | 5  | E  | U  | e  | u  |    |    | ¥  | µ  | Å  | ö  | å  | ö  |
| 06 |    |    | &  | 6  | F  | V  | f  | v  |    |    |    | ¶  | Æ  | ø  | æ  | ø  |
| 07 |    |    | '  | 7  | G  | W  | g  | w  |    |    | §  | •  | Ç  | ×  | ç  | ÷  |
| 08 |    |    | (  | 8  | H  | X  | h  | x  |    |    | ¨  | ,  | È  | Ø  | è  | ø  |
| 09 |    |    | )  | 9  | I  | Y  | i  | y  |    |    | ©  | ¹  | É  | Ů  | é  | ů  |
| 0A |    |    | *  | :  | J  | Z  | j  | z  |    |    | ª  | º  | Ê  | Ú  | ê  | ú  |
| 0B |    |    | +  | ;  | K  | [  | k  | {  |    |    | «  | »  | Ë  | Ů  | ë  | ů  |
| 0C |    |    | ,  | <  | L  | \  | l  |    |    |    | ¬  | ¼  | Ì  | Ů  | ì  | ü  |
| 0D |    |    | -  | =  | M  | ]  | m  | }  |    |    | -  | ½  | Í  | İ  | í  | ı  |
| 0E |    |    | .  | >  | N  | ^  | n  | ~  |    |    | •  | ¾  | Î  | Ş  | î  | ş  |
| 0F |    |    | /  | ?  | O  | _  | o  |    |    |    | -  | ¿  | Ï  | ß  | ï  | ÿ  |

# ISO 8859-15 (Western Europe)

|   | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | A0 | B0 | C0 | D0 | E0 | F0 |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0 |    | 0  | @  | P  |    | p  |    |    |    | °  | À  | Ä  | à  | ä  |
| 1 | !  | 1  | A  | Q  | a  | q  |    |    | ı  | ±  | Á  | Ñ  | á  | ñ  |
| 2 | "  | 2  | B  | R  | b  | r  |    |    | ç  | ²  | Â  | Ò  | â  | ò  |
| 3 | #  | 3  | C  | S  | c  | s  |    |    | £  | ³  | Ã  | Ó  | ã  | ó  |
| 4 | \$ | 4  | D  | T  | d  | t  |    |    | €  | Ž  | Ä  | Ö  | ä  | ö  |
| 5 | %  | 5  | E  | U  | e  | u  |    |    | ¥  | μ  | Å  | Ö  | å  | ö  |
| 6 | &  | 6  | F  | V  | f  | v  |    |    | Š  | ¶  | Æ  | Ö  | æ  | ö  |
| 7 | '  | 7  | G  | W  | g  | w  |    |    | š  | •  | Ç  | ×  | ç  | ÷  |
| 8 | (  | 8  | H  | X  | h  | x  |    |    | š  | ž  | È  | Ø  | è  | ø  |
| 9 | )  | 9  | I  | Y  | i  | ÿ  |    |    | ©  | ¹  | É  | Ù  | é  | ù  |
| A | *  | :  | J  | Z  | j  | z  |    |    | ª  | º  | Ê  | Ú  | ê  | ú  |
| B | +  | ;  | K  | [  | k  | {  |    |    | «  | »  | Ë  | Û  | ë  | û  |
| C | ,  | <  | L  | \  | l  | ı  |    |    | ¬  | œ  | Ì  | Ü  | ì  | ü  |
| D | -  | =  | M  | ]  | m  | }  |    |    | -  | œ  | Í  | Ý  | í  | ý  |
| E | .  | >  | N  | ^  | n  | ˘  |    |    | @  | Ÿ  | Î  | Þ  | î  | þ  |
| F | /  | ?  | O  | _  | o  |    |    |    | -  | ı  | İ  | ß  | ı  | ÿ  |

# National Variations

## Epson National Variations

|                 | 35 | 36 | 60 | 62 | 64 | 91 | 92 | 93 | 94 | 96 | 105 | 123 | 124 | 125 | 126 | (dec.) |
|-----------------|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|--------|
| USA             | #  | \$ | <  | >  | @  | [  | \  | ]  | ^  | `  | i   | {   |     | }   | ~   |        |
| FRANCE          | #  | \$ | <  | >  | à  | °  | ç  | §  | ^  | `  | i   | é   | ù   | è   | ¨   |        |
| GERMANY         | #  | \$ | <  | >  | §  | Ä  | Ö  | U  | ^  | `  | i   | ä   | ö   | ü   | ß   |        |
| UNITED KINGDOM  | £  | \$ | <  | >  | @  | [  | \  | ]  | ^  | `  | i   | {   |     | }   | ~   |        |
| DENMARK-1       | #  | \$ | <  | >  | @  | Æ  | Ø  | Å  | ^  | `  | i   | æ   | ø   | å   | ~   |        |
| SWEDEN          | #  | ¤  | <  | >  | £  | Ä  | Ö  | Å  | U  | é  | i   | ä   | ö   | å   | ü   |        |
| ITALY           | #  | \$ | <  | >  | @  | °  | \  | é  | ^  | `  | ù   | i   | à   | ò   | è   | i      |
| SPAIN-1         | ¢  | \$ | <  | >  | @  | ;  | Ñ  | ¿  | ^  | `  | i   | ¨   | ñ   | }   | ~   |        |
| JAPAN           | #  | \$ | <  | >  | @  | [  | ¥  | ]  | ^  | `  | i   | {   |     | }   | ~   |        |
| NORWAY          | #  | ¤  | <  | >  | £  | Æ  | Ø  | Å  | U  | é  | i   | æ   | ø   | å   | ü   |        |
| DENMARK-2       | #  | \$ | <  | >  | £  | Æ  | Ø  | Å  | U  | é  | i   | æ   | ø   | å   | ü   |        |
| SPAIN-2         | #  | \$ | <  | >  | á  | ;  | Ñ  | ¿  | é  | `  | i   | í   | ñ   | ó   | ú   |        |
| LATIN AMERICA   | #  | \$ | <  | >  | á  | ;  | Ñ  | ¿  | é  | ü  | i   | í   | ñ   | ó   | ú   |        |
| KOREA           | #  | \$ | <  | >  | @  | [  | ₩  | ]  | ^  | `  | i   | {   |     | }   | ~   |        |
| LEGAL           | #  | \$ | <  | >  | §  | °  | ´  | ¨  | ¶  | `  | i   | ©   | ®   | †   | ™   |        |
| NETHERLANDS     | £  | \$ | <  | >  | @  | ƒ  | \  | ij | ^  | `  | i   | {   |     | }   | ~   |        |
| ANGLO-UNIVERSAL | #  | \$ | <  | >  | @  | [  | ¥  | ]  | ¢  | £  | i   | {   |     | }   | ~   |        |
| SPANISH-AMERICA | #  | \$ | <  | >  | @  | £  | Ñ  | ¿  | `  | i  | ¨   | ñ   | º   | ;   |     |        |
| PORTUGAL        | £  | \$ | <  | >  | à  | À  | Ç  | Õ  | ^  | º  | i   | ä   | ç   | õ   | ~   |        |
| AFRICA          | £  | \$ | <  | >  | @  | h  | l  | °  | ^  | `  | i   | {   | ÷   | }   | ~   |        |
| SWITZERLAND     | £  | \$ | é  | è  | §  | [  | ç  | ]  | ^  | `  | i   | ä   | ö   | ü   | ~   |        |
| TURKEY          | ₺  | é  | i  | ı  | Ç  | Ğ  | Ö  | Ş  | Ü  | ç  | ı   | ğ   | ö   | ş   | ü   |        |
| GREECE          | #  | \$ | <  | >  | !  | §  | ç  | ^  | Δ  | ²  | i   | ³   | ¨   | ´   | β   |        |
| YUGOSLAVIA      | #  | \$ | <  | >  | Ž  | Š  | Đ  | Č  | Č  | ž  | i   | š   | đ   | č   | č   |        |
| CYRILLIC        | #  | \$ | £  | '  | *  | ;  | @  | [  | \  | ]  | ^   | `   | Ц   | {   |     | ~      |

23 24 26 27 2A 3B 40 5B 5C 5D 5E 60 71 7B 7C 7D 7E (hex.)

# ANSI National Variations

|                    | 33 | 35 | 36 | 38 | 39 | 42 | 59 | 64 | 91 | 92 | 93 | 94 | 96 | 113 | 123 | 124 | 125 | 126 | (dec.) |
|--------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|--------|
| USA                | !  | #  | \$ | &  | '  | *  | ;  | @  | [  | \  | ]  | ^  | `  | q   | {   |     | }   | ~   |        |
| German             | !  | #  | \$ | &  | '  | *  | ;  | S  | A  | O  | U  | ^  | `  | q   | ä   | ö   | ü   | ß   |        |
| French A           | !  | £  | \$ | &  | '  | *  | ;  | à  | °  | ç  | §  | ^  | `  | q   | é   | ù   | è   | ..  |        |
| French B           | !  | é  | à  | í  | '  | ë  | ;  | è  | á  | \  | û  | ú  | ç  | q   | {   |     | }   | ô   |        |
| French/Canadian    | !  | #  | \$ | &  | '  | *  | ;  | à  | â  | ç  | é  | í  | ô  | q   | é   | ù   | è   | û   |        |
| Netherlands        | !  | #  | ƒ  | &  | '  | *  | ;  | @  | [  | \  | ]  | ^  | `  | q   | ˆ   |     | ij  | ..  |        |
| Italian            | !  | £  | \$ | &  | '  | *  | ;  | §  | °  | ç  | é  | ^  | ù  | q   | à   | ò   | è   | ì   |        |
| United Kingdom     | !  | £  | \$ | &  | '  | *  | ;  | @  | [  | \  | ]  | ^  | `  | q   | {   |     | }   | ~   |        |
| Spanish            | !  | £  | \$ | &  | '  | *  | ;  | @  | ;  | Ñ  | ¿  | ^  | `  | q   | ..  | ñ   | }   | ~   |        |
| Danish/Norwegian A | !  | #  | \$ | &  | '  | *  | ;  | @  | Æ  | Ø  | Å  | ^  | `  | q   | æ   | ø   | å   | ~   |        |
| Danish/Norwegian B | !  | #  | ¤  | &  | '  | *  | ;  | @  | Æ  | Ø  | Å  | ^  | `  | q   | æ   | ø   | å   | ~   |        |
| Danish/Norwegian C | !  | #  | \$ | &  | '  | *  | ;  | ⌘  | Æ  | Ø  | Å  | U  | é  | q   | æ   | ø   | å   | ü   |        |
| Danish/Norwegian D | !  | #  | ¤  | &  | '  | *  | ;  | ⌘  | Æ  | Ø  | Å  | U  | é  | q   | æ   | ø   | å   | ü   |        |
| Swedish/Finnish A  | !  | #  | \$ | &  | '  | *  | ;  | @  | Å  | Ö  | Å  | ^  | `  | q   | ä   | ö   | å   | ~   |        |
| Swedish/Finnish B  | !  | #  | ¤  | &  | '  | *  | ;  | @  | Å  | Ö  | Å  | ^  | `  | q   | ä   | ö   | å   | ~   |        |
| Swedish/Finnish C  | !  | #  | \$ | &  | '  | *  | ;  | ⌘  | Å  | Ö  | Å  | U  | é  | q   | ä   | ö   | å   | ü   |        |
| Swedish/Finnish D  | !  | #  | ¤  | &  | '  | *  | ;  | ⌘  | Å  | Ö  | Å  | U  | é  | q   | ä   | ö   | å   | ü   |        |
| Switzerland        | !  | #  | \$ | &  | '  | *  | ;  | ç  | à  | é  | è  | ^  | `  | q   | ä   | ö   | ü   | ~   |        |
| USA (ISO)          | !  | #  | \$ | &  | '  | *  | ;  | @  | [  | \  | ]  | ^  | `  | q   | {   |     | }   | ~   |        |
| Yugoslavia         | !  | #  | \$ | &  | '  | *  | ;  | Ž  | Š  | Đ  | Ć  | Č  | Ž  | q   | š   | đ   | ć   | č   |        |
| United Kingdom A   | !  | £  | \$ | &  | '  | *  | ;  | @  | [  | \  | ]  | ^  | `  | q   | {   |     | }   | ~   |        |
| Turkey             | !  | İ  | \$ | &  | '  | *  | ;  | Ç  | Ş  | İ  | Ö  | U  | ç  | ğ   | ş   | ı   | ö   | ü   |        |
| Greece             | Γ  | Δ  | \$ | Θ  | Λ  | *  | Ξ  | Π  | Σ  | Φ  | Ψ  | Ω  | `  | q   | {   |     | }   | ~   |        |
| Cyrillic           | !  | #  | \$ | &  | '  | *  | ;  | @  | [  | \  | ]  | ^  | `  | q   | {   |     | }   | ~   |        |

21 23 24 26 27 2A 3B 40 5B 5C 5D 5E 60 71 7B 7C 7D 7E (hex.)

# Character Generator Tables

## Character Generator Table (1/4)

|                                         |   | UPPER NIBBLE |         |         |         |         |          |          |          |          |          |          |          |          |          |          |          |
|-----------------------------------------|---|--------------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                                         |   | 0            | 1       | 2       | 3       | 4       | 5        | 6        | 7        | 8        | 9        | A        | B        | C        | D        | E        | F        |
| LOW<br>ER<br>N<br>I<br>B<br>B<br>L<br>E | 0 | 0<br>0       | 1<br>16 | 2<br>32 | 3<br>48 | 4<br>64 | 5<br>80  | 6<br>96  | 7<br>112 | 8<br>128 | 9<br>144 | A<br>160 | B<br>176 | C<br>192 | D<br>208 | E<br>224 | F<br>240 |
|                                         | 1 | 1<br>17      | 2<br>33 | 3<br>49 | 4<br>65 | 5<br>81 | 6<br>97  | 7<br>113 | 8<br>129 | 9<br>145 | A<br>161 | B<br>177 | C<br>193 | D<br>209 | E<br>225 | F<br>241 |          |
|                                         | 2 | 2<br>18      | 3<br>34 | 4<br>50 | 5<br>66 | 6<br>82 | 7<br>98  | 8<br>114 | 9<br>130 | A<br>146 | B<br>162 | C<br>178 | D<br>194 | E<br>210 | F<br>226 |          | 242      |
|                                         | 3 | 3<br>19      | 4<br>35 | 5<br>51 | 6<br>67 | 7<br>83 | 8<br>99  | 9<br>115 | A<br>131 | B<br>147 | C<br>163 | D<br>179 | E<br>195 | F<br>211 |          | 227      | 243      |
|                                         | 4 | 4<br>20      | 5<br>36 | 6<br>52 | 7<br>68 | 8<br>84 | 9<br>100 | A<br>116 | B<br>132 | C<br>148 | D<br>164 | E<br>180 | F<br>196 |          | 212      | 228      | 244      |
|                                         | 5 | 5<br>21      | 6<br>37 | 7<br>53 | 8<br>69 | 9<br>85 | A<br>101 | B<br>117 | C<br>133 | D<br>149 | E<br>165 | F<br>181 |          | 197      | 213      | 229      | 245      |
|                                         | 6 | 6<br>22      | 7<br>38 | 8<br>54 | 9<br>70 | A<br>86 | B<br>102 | C<br>118 | D<br>134 | E<br>150 | F<br>166 |          | 182      | 198      | 214      | 230      | 246      |
|                                         | 7 | 7<br>23      | 8<br>39 | 9<br>55 | A<br>71 | B<br>87 | C<br>103 | D<br>119 | E<br>135 | F<br>151 |          | 167      | 183      | 199      | 215      | 231      | 247      |
|                                         | 8 | 8<br>24      | 9<br>40 | A<br>56 | B<br>72 | C<br>88 | D<br>104 | E<br>120 | F<br>136 |          | 152      | 168      | 184      | 200      | 216      | 232      | 248      |
|                                         | 9 | 9<br>25      | A<br>41 | B<br>57 | C<br>73 | D<br>89 | E<br>105 | F<br>121 |          | 137      | 153      | 169      | 185      | 201      | 217      | 233      | 249      |
|                                         | A | A<br>26      | B<br>42 | C<br>58 | D<br>74 | E<br>90 | F<br>106 |          | 122      | 138      | 154      | 170      | 186      | 202      | 218      | 234      | 250      |
|                                         | B | B<br>27      | C<br>43 | D<br>59 | E<br>75 | F<br>91 |          | 107      | 123      | 139      | 155      | 171      | 187      | 203      | 219      | 235      | 251      |
|                                         | C | C<br>28      | D<br>44 | E<br>60 | F<br>76 |         | 92       | 108      | 124      | 140      | 156      | 172      | 188      | 204      | 220      | 236      | 252      |
|                                         | D | D<br>29      | E<br>45 | F<br>61 |         | 77      | 93       | 109      | 125      | 141      | 157      | 173      | 189      | 205      | 221      | 237      | 253      |
|                                         | E | E<br>30      | F<br>46 |         | 62      | 78      | 94       | 110      | 126      | 142      | 158      | 174      | 190      | 206      | 222      | 238      | 254      |
|                                         | F | F<br>31      |         | 47      | 63      | 79      | 95       | 111      | 127      | 143      | 159      | 175      | 191      | 207      | 223      | 239      | 255      |

# Character Generator Table (2/4)

|                       |   | UPPER NIBBLES |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------|---|---------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                       |   | 10            | 11     | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19    | 1A    | 1B    | 1C    | 1D    | 1E    | 1F    |
| L<br>O<br>W<br>E<br>R | 0 | ¤ 256         | ¢ 272  | Δ 288 | υ 304 | Λ 320 | Ð 336 | Ů 352 | ü 368 | † 384 | À 400 | đ 416 | œ 432 | ŋ 448 | ķ 464 | ! 480 | Ł 496 |
|                       | 1 | " 257         | ı 273  | Θ 289 | φ 305 | Ł 321 | ð 337 | ů 353 | ţ 369 | Ž 385 | Ɛ 401 | Ƴ 417 | č 433 | Ā 449 | Ľ 465 | β 481 | ŀ 497 |
|                       | 2 | Ø 258         | ı 274  | Λ 290 | χ 306 | Ɔ 322 | Ɔ 338 | Ɔ 354 | Ɔ 370 | Ɔ 386 | Ɔ 402 | Ɔ 418 | Ɔ 434 | Ɔ 450 | Ɔ 466 | Ɔ 482 | 498   |
|                       | 3 | Á 259         | ıj 275 | Σ 291 | ψ 307 | Ɔ 323 | Ƴ 339 | Ƴ 355 | Ƴ 371 | Ƴ 387 | Ƴ 403 | Ƴ 419 | Ƴ 435 | Ƴ 451 | Ƴ 467 | Ƴ 483 | 499   |
|                       | 4 | À 260         | h 276  | Π 292 | ω 308 | Đ 324 | Ɔ 340 | Ɔ 356 | Ɔ 372 | Ɔ 388 | Ɔ 404 | Ɔ 420 | Ɔ 436 | Ɔ 452 | Ɔ 468 | Ɔ 484 | 500   |
|                       | 5 | Ā 261         | ℓ 277  | Ɔ 293 | Ψ 309 | Ń 325 | Ɔ 341 | Ɔ 357 | Ɔ 373 | Ɔ 389 | Ɔ 405 | Ɔ 421 | Ɔ 437 | Ɔ 453 | Ɔ 469 | Ɔ 485 | 501   |
|                       | 6 | Ā 262         | ℓ 278  | Ɔ 294 | α 310 | Ń 326 | Ɔ 342 | Ɔ 358 | Ɔ 374 | Ɔ 390 | Ɔ 406 | Ɔ 422 | Ɔ 438 | Ɔ 454 | Ɔ 470 | Ɔ 486 | 502   |
|                       | 7 | ā 263         | ı 279  | ε 295 | é 311 | ō 327 | ō 343 | ō 359 | ō 375 | ō 391 | ō 407 | ō 423 | ō 439 | ō 455 | ō 471 | ō 487 | 503   |
|                       | 8 | Ē 264         | ı 280  | ζ 296 | ŋ 312 | Ŕ 328 | ĉ 344 | ĥ 360 | ˘ 376 | Ɔ 392 | Ɔ 408 | Ɔ 424 | Ɔ 440 | Ɔ 456 | Ɔ 472 | Ɔ 488 | 504   |
|                       | 9 | Ē 265         | č 281  | η 297 | ı 313 | × 329 | þ 345 | é 361 | é 377 | š 393 | š 409 | š 425 | š 441 | š 457 | š 473 | š 489 | 505   |
|                       | A | ó 266         | ğ 282  | ı 298 | ı 314 | • 330 | • 346 | • 362 | • 378 | • 394 | • 410 | • 426 | • 442 | • 458 | • 474 | • 490 | 506   |
|                       | B | ò 267         | ſ 283  | κ 299 | ú 315 | • 331 | • 347 | • 363 | • 379 | • 395 | • 411 | • 427 | • 443 | • 459 | • 475 | • 491 | 507   |
|                       | C | ō 268         | g 284  | λ 300 | ü 316 | ı 332 | č 348 | ĥ 364 | š 380 | ˘ 396 | ō 412 | ŕ 428 | ı 444 | ı 460 | ı 476 | ı 492 | 508   |
|                       | D | ó 269         | ı 285  | ν 301 | ó 317 | • 333 | š 349 | ō 365 | ŕ 381 | ž 397 | č 413 | ŵ 429 | ı 445 | ı 461 | ı 477 | ı 493 | 509   |
|                       | E | ō 270         | h 286  | é 302 | ç 318 | • 334 | č 350 | ř 366 | ŕ 382 | ž 398 | č 414 | ŵ 430 | ı 446 | ı 462 | ı 478 | ı 494 | 510   |
|                       | F | Ů 271         | ˘ 287  | ρ 303 | Ɔ 319 | • 335 | • 351 | • 367 | • 383 | • 399 | • 415 | • 431 | • 447 | • 463 | • 479 | • 495 | 511   |

# Character Generator Table (3/4)

|                       |   | UPPER NIBBLES |          |          |          |          |          |          |          |          |          |          |          |          |          |          |     |
|-----------------------|---|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----|
|                       |   | 20            | 21       | 22       | 23       | 24       | 25       | 26       | 27       | 28       | 29       | 2A       | 2B       | 2C       | 2D       | 2E       | 2F  |
| L<br>O<br>W<br>E<br>R | 0 | А<br>512      | И<br>528 | Р<br>544 | Ш<br>560 | Ъ<br>576 | Ъ<br>592 | К<br>608 | Г<br>624 | К<br>640 | У<br>656 | Ц<br>672 | Х<br>688 | У<br>704 | Г<br>720 | Х<br>736 | 752 |
|                       | 1 | а<br>513      | и<br>529 | р<br>545 | ш<br>561 | ъ<br>577 | ъ<br>593 | к<br>609 | г<br>625 | к<br>641 | у<br>657 | ц<br>673 | х<br>689 | у<br>705 | г<br>721 | х<br>737 | 753 |
|                       | 2 | Б<br>514      | И<br>530 | С<br>546 | Щ<br>562 | Г<br>578 | К<br>594 | Л<br>610 | У<br>626 | Л<br>642 | У<br>658 | П<br>674 | І<br>690 | Г<br>706 | Г<br>722 | Х<br>738 | 754 |
|                       | 3 | б<br>515      | й<br>531 | с<br>547 | щ<br>563 | г<br>579 | к<br>595 | л<br>611 | у<br>627 | л<br>643 | у<br>659 | п<br>675 | і<br>691 | г<br>707 | г<br>723 | х<br>739 | 755 |
|                       | 4 | В<br>516      | К<br>532 | Т<br>548 | Ъ<br>564 | Е<br>580 | У<br>596 | П<br>612 | В<br>628 | В<br>644 | В<br>660 | А<br>676 | І<br>692 | Г<br>708 | Г<br>724 | Х<br>740 | 756 |
|                       | 5 | в<br>517      | к<br>533 | т<br>549 | ъ<br>565 | е<br>581 | у<br>597 | п<br>613 | в<br>629 | в<br>645 | в<br>661 | а<br>677 | і<br>693 | г<br>709 | г<br>725 | х<br>741 | 757 |
|                       | 6 | Г<br>518      | Л<br>534 | У<br>550 | Ы<br>566 | С<br>582 | Ц<br>598 | Г<br>614 | Х<br>630 | Г<br>646 | Х<br>662 | А<br>678 | Е<br>694 | Г<br>710 | Г<br>726 | Х<br>742 | 758 |
|                       | 7 | г<br>519      | л<br>535 | у<br>551 | ы<br>567 | с<br>583 | ц<br>599 | п<br>615 | х<br>631 | г<br>647 | х<br>663 | а<br>679 | е<br>695 | г<br>711 | г<br>727 | х<br>743 | 759 |
|                       | 8 | Д<br>520      | М<br>536 | Ф<br>552 | Ь<br>568 | І<br>584 | В<br>600 | Г<br>616 | В<br>632 | Г<br>648 | Г<br>664 | Е<br>680 | Х<br>696 | Г<br>712 | Г<br>728 | Х<br>744 | 760 |
|                       | 9 | д<br>521      | м<br>537 | ф<br>553 | ь<br>569 | і<br>585 | в<br>601 | г<br>617 | в<br>633 | г<br>649 | г<br>665 | е<br>681 | х<br>697 | г<br>713 | г<br>729 | х<br>745 | 761 |
|                       | A | Е<br>522      | Н<br>538 | Х<br>554 | Э<br>570 | Ј<br>586 | Г<br>602 | Л<br>618 | Г<br>634 | Л<br>650 | Л<br>666 | Г<br>682 | Т<br>698 | Г<br>714 | Г<br>730 | Х<br>746 | 762 |
|                       | B | е<br>523      | н<br>539 | х<br>555 | э<br>571 | ј<br>587 | г<br>603 | л<br>619 | г<br>635 | л<br>651 | л<br>667 | г<br>683 | т<br>699 | г<br>715 | г<br>731 | х<br>747 | 763 |
|                       | C | Ж<br>524      | О<br>540 | Ц<br>556 | Ю<br>572 | Ѓ<br>588 | Г<br>604 | Л<br>620 | Л<br>636 | Л<br>652 | Л<br>668 | Х<br>684 | Ш<br>700 | Г<br>716 | Г<br>732 | Х<br>748 | 764 |
|                       | D | ж<br>525      | о<br>541 | ц<br>557 | ю<br>573 | ѓ<br>589 | г<br>605 | л<br>621 | л<br>637 | л<br>653 | л<br>669 | х<br>685 | ш<br>701 | г<br>717 | г<br>733 | х<br>749 | 765 |
|                       | E | Э<br>526      | П<br>542 | Ч<br>558 | Я<br>574 | Ь<br>590 | В<br>606 | Г<br>622 | В<br>638 | В<br>654 | В<br>670 | В<br>686 | І<br>702 | Г<br>718 | Г<br>734 | Х<br>750 | 766 |
|                       | F | э<br>527      | п<br>543 | ч<br>559 | я<br>575 | ь<br>591 | в<br>607 | г<br>623 | в<br>639 | в<br>655 | в<br>671 | в<br>687 | і<br>703 | г<br>719 | г<br>735 | х<br>751 | 767 |

# Character Generator Table (4/4)

|                       |   | UPPER NIBBLES |            |            |            |            |            |            |            |            |            |            |            |            |            |            |    |
|-----------------------|---|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----|
|                       |   | 30            | 31         | 32         | 33         | 34         | 35         | 36         | 37         | 38         | 39         | 3A         | 3B         | 3C         | 3D         | 3E         | 3F |
| L<br>O<br>W<br>E<br>R | 0 | ٠<br>768      | ١<br>769   | ٢<br>800   | ٣<br>816   | ٤<br>832   | ٥<br>848   | ٦<br>864   | ٧<br>880   | ٨<br>896   | ٩<br>912   | ١٠<br>928  | ١١<br>944  | ١٢<br>960  | ١٣<br>976  | ١٤<br>992  |    |
|                       | 1 | ١٥<br>769     | ١٦<br>785  | ١٧<br>801  | ١٨<br>817  | ١٩<br>833  | ٢٠<br>849  | ٢١<br>865  | ٢٢<br>881  | ٢٣<br>897  | ٢٤<br>913  | ٢٥<br>929  | ٢٦<br>945  | ٢٧<br>961  | ٢٨<br>977  | ٢٩<br>993  |    |
|                       | 2 | ٣٠<br>770     | ٣١<br>786  | ٣٢<br>802  | ٣٣<br>818  | ٣٤<br>834  | ٣٥<br>850  | ٣٦<br>866  | ٣٧<br>882  | ٣٨<br>898  | ٣٩<br>914  | ٤٠<br>930  | ٤١<br>946  | ٤٢<br>962  | ٤٣<br>978  | ٤٤<br>994  |    |
|                       | 3 | ٤٥<br>771     | ٤٦<br>787  | ٤٧<br>803  | ٤٨<br>819  | ٤٩<br>835  | ٥٠<br>851  | ٥١<br>867  | ٥٢<br>883  | ٥٣<br>899  | ٥٤<br>915  | ٥٥<br>931  | ٥٦<br>947  | ٥٧<br>963  | ٥٨<br>979  | ٥٩<br>995  |    |
|                       | 4 | ٦٠<br>772     | ٦١<br>788  | ٦٢<br>804  | ٦٣<br>820  | ٦٤<br>836  | ٦٥<br>852  | ٦٦<br>868  | ٦٧<br>884  | ٦٨<br>900  | ٦٩<br>916  | ٧٠<br>932  | ٧١<br>948  | ٧٢<br>964  | ٧٣<br>980  | ٧٤<br>996  |    |
|                       | 5 | ٧٥<br>773     | ٧٦<br>789  | ٧٧<br>805  | ٧٨<br>821  | ٧٩<br>837  | ٨٠<br>853  | ٨١<br>869  | ٨٢<br>885  | ٨٣<br>901  | ٨٤<br>917  | ٨٥<br>933  | ٨٦<br>949  | ٨٧<br>965  | ٨٨<br>981  | ٨٩<br>997  |    |
|                       | 6 | ٩٠<br>774     | ٩١<br>790  | ٩٢<br>806  | ٩٣<br>822  | ٩٤<br>838  | ٩٥<br>854  | ٩٦<br>870  | ٩٧<br>886  | ٩٨<br>902  | ٩٩<br>918  | ١٠٠<br>934 | ١٠١<br>950 | ١٠٢<br>966 | ١٠٣<br>982 | ١٠٤<br>998 |    |
|                       | 7 | ١٠٥<br>775    | ١٠٦<br>791 | ١٠٧<br>807 | ١٠٨<br>823 | ١٠٩<br>839 | ١١٠<br>855 | ١١١<br>871 | ١١٢<br>887 | ١١٣<br>903 | ١١٤<br>919 | ١١٥<br>935 | ١١٦<br>951 | ١١٧<br>967 | ١١٨<br>983 | ١١٩<br>999 |    |
|                       | 8 | ١٢٠<br>776    | ١٢١<br>792 | ١٢٢<br>808 | ١٢٣<br>824 | ١٢٤<br>840 | ١٢٥<br>856 | ١٢٦<br>872 | ١٢٧<br>888 | ١٢٨<br>904 | ١٢٩<br>920 | ١٣٠<br>936 | ١٣١<br>952 | ١٣٢<br>968 | ١٣٣<br>984 |            |    |
|                       | 9 | ١٣٥<br>777    | ١٣٦<br>793 | ١٣٧<br>809 | ١٣٨<br>825 | ١٣٩<br>841 | ١٤٠<br>857 | ١٤١<br>873 | ١٤٢<br>889 | ١٤٣<br>905 | ١٤٤<br>921 | ١٤٥<br>937 | ١٤٦<br>953 | ١٤٧<br>969 | ١٤٨<br>985 |            |    |
|                       | A | ١٤٩<br>778    | ١٥٠<br>794 | ١٥١<br>810 | ١٥٢<br>826 | ١٥٣<br>842 | ١٥٤<br>858 | ١٥٥<br>874 | ١٥٦<br>890 | ١٥٧<br>906 | ١٥٨<br>922 | ١٥٩<br>938 | ١٦٠<br>954 | ١٦١<br>970 | ١٦٢<br>986 |            |    |
|                       | B | ١٦٥<br>779    | ١٦٦<br>795 | ١٦٧<br>811 | ١٦٨<br>827 | ١٦٩<br>843 | ١٧٠<br>859 | ١٧١<br>875 | ١٧٢<br>891 | ١٧٣<br>907 | ١٧٤<br>923 | ١٧٥<br>939 | ١٧٦<br>955 | ١٧٧<br>971 | ١٧٨<br>987 |            |    |
|                       | C | ١٧٩<br>780    | ١٨٠<br>796 | ١٨١<br>812 | ١٨٢<br>828 | ١٨٣<br>844 | ١٨٤<br>860 | ١٨٥<br>876 | ١٨٦<br>892 | ١٨٧<br>908 | ١٨٨<br>924 | ١٨٩<br>940 | ١٩٠<br>956 | ١٩١<br>972 | ١٩٢<br>988 |            |    |
|                       | D | ١٩٥<br>781    | ١٩٦<br>797 | ١٩٧<br>813 | ١٩٨<br>829 | ١٩٩<br>845 | ٢٠٠<br>861 | ٢٠١<br>877 | ٢٠٢<br>893 | ٢٠٣<br>909 | ٢٠٤<br>925 | ٢٠٥<br>941 | ٢٠٦<br>957 | ٢٠٧<br>973 | ٢٠٨<br>989 |            |    |
|                       | E | ٢٠٩<br>782    | ٢١٠<br>798 | ٢١١<br>814 | ٢١٢<br>830 | ٢١٣<br>846 | ٢١٤<br>862 | ٢١٥<br>878 | ٢١٦<br>894 | ٢١٧<br>910 | ٢١٨<br>926 | ٢١٩<br>942 | ٢٢٠<br>958 | ٢٢١<br>974 | ٢٢٢<br>990 |            |    |
|                       | F | ٢٢٥<br>783    | ٢٢٦<br>799 | ٢٢٧<br>815 | ٢٢٨<br>831 | ٢٢٩<br>847 | ٢٣٠<br>863 | ٢٣١<br>879 | ٢٣٢<br>895 | ٢٣٣<br>911 | ٢٣٤<br>927 | ٢٣٥<br>943 | ٢٣٦<br>959 | ٢٣٧<br>975 | ٢٣٨<br>991 |            |    |

# Hexadecimal to Decimal Table

|    | 00 | 10 | 20 | 30 | 40 | 50 | 60  | 70  | 80  | 90  | A0  | B0  | C0  | D0  | E0  | F0  |
|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 00 | 0  | 16 | 32 | 48 | 64 | 80 | 96  | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 |
| 01 | 1  | 17 | 33 | 49 | 65 | 81 | 97  | 113 | 129 | 145 | 161 | 177 | 193 | 209 | 225 | 241 |
| 02 | 2  | 18 | 34 | 50 | 66 | 82 | 98  | 114 | 130 | 146 | 162 | 178 | 194 | 210 | 226 | 242 |
| 03 | 3  | 19 | 35 | 51 | 67 | 83 | 99  | 115 | 131 | 147 | 163 | 179 | 195 | 211 | 227 | 243 |
| 04 | 4  | 20 | 36 | 52 | 68 | 84 | 100 | 116 | 132 | 148 | 164 | 180 | 196 | 212 | 228 | 244 |
| 05 | 5  | 21 | 37 | 53 | 69 | 85 | 101 | 117 | 133 | 149 | 165 | 181 | 197 | 213 | 229 | 245 |
| 06 | 6  | 22 | 38 | 54 | 70 | 86 | 102 | 118 | 134 | 150 | 166 | 182 | 198 | 214 | 230 | 246 |
| 07 | 7  | 23 | 39 | 55 | 71 | 87 | 103 | 119 | 135 | 151 | 167 | 183 | 199 | 215 | 231 | 247 |
| 08 | 8  | 24 | 40 | 56 | 72 | 88 | 104 | 120 | 136 | 152 | 168 | 184 | 200 | 216 | 232 | 248 |
| 09 | 9  | 25 | 41 | 57 | 73 | 89 | 105 | 121 | 137 | 153 | 169 | 185 | 201 | 217 | 233 | 249 |
| 0A | 10 | 26 | 42 | 58 | 74 | 90 | 106 | 122 | 138 | 154 | 170 | 186 | 202 | 218 | 234 | 250 |
| 0B | 11 | 27 | 43 | 59 | 75 | 91 | 107 | 123 | 139 | 155 | 171 | 187 | 203 | 219 | 235 | 251 |
| 0C | 12 | 28 | 44 | 60 | 76 | 92 | 108 | 124 | 140 | 156 | 172 | 188 | 204 | 220 | 236 | 252 |
| 0D | 13 | 29 | 45 | 61 | 77 | 93 | 109 | 125 | 141 | 157 | 173 | 189 | 205 | 221 | 237 | 253 |
| 0E | 14 | 30 | 46 | 62 | 78 | 94 | 110 | 126 | 142 | 158 | 174 | 190 | 206 | 222 | 238 | 254 |
| 0F | 15 | 31 | 47 | 63 | 79 | 95 | 111 | 127 | 143 | 159 | 175 | 191 | 207 | 223 | 239 | 255 |

# Interfaces

This appendix provides technical information for the parallel and serial interfaces

## The Parallel Interface

The parallel interface is available on a specific 36-pin connector type AMPHENOL 57-40360-12-D56 or equivalent. This corresponds to the IEEE 1284 connector type B.

The interface mode is selected via menu, see in the *System Menu*, under INTERFACE, the I/F:TYPE function (I/F:TYPE:BOTH, I/F:TYPE:PARALL and I/F:TYPE:SERIAL values), please refer to the *User's Manual* on the CD-Rom.

**An alternate connector will be available on an optional board, providing connector 1284 type C (miniature 36-pin connector).**

- *Drive Capability*  
15 feet (5 m) on AWG26 min. wire size of twisted conductors on TTL receiver
- *Printer Connector Type*  
AMPHENOL 57-40360-12-D56 or equivalent
- *Cable Connector*  
AMPHENOL 57-30360-12 or equivalent Interface
- *Signals*  
The interface pin assignment is described in the table on the following page:

| Signal Name | Pin Number |      |             | Source | Description                                                                                                                                                                         |
|-------------|------------|------|-------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Signal     | Wire | Return Wire |        |                                                                                                                                                                                     |
| STROBE      | 1          |      | 19          | HOST   | Active LOW level signal. Clock signal which controls data transmission. The pulse width must not be less than 0.5/usec at the input.                                                |
| ACK         | 10         |      | 28          | PRT    | Active LOW level signal. Indicates that the data has been received and stored in the input buffer.                                                                                  |
| DATA BIT 1  | 2          |      | 20          | HOST   | Represents transmitted data; logical "1" is represented by HIGH level signal. Logical "0" is represented by LOW level signal. DATA BIT 1 (pin 2) is the least significant bit.      |
| DATA BIT 2  | 3          |      | 21          |        |                                                                                                                                                                                     |
| DATA BIT 3  | 4          |      | 22          |        |                                                                                                                                                                                     |
| DATA BIT 4  | 5          |      | 23          |        |                                                                                                                                                                                     |
| DATA BIT 5  | 6          |      | 24          |        |                                                                                                                                                                                     |
| DATA BIT 6  | 7          |      | 25          |        |                                                                                                                                                                                     |
| DATA BIT 7  | 8          |      | 26          |        |                                                                                                                                                                                     |
| DATA BIT 8  | 9          |      | 27          |        |                                                                                                                                                                                     |
| BUSY        | 11         |      | 29          | PRT    | An active HIGH level signal that indicates that the printer cannot accept data or control codes.                                                                                    |
| PE          | 12         |      | 30          | PRT    | Active HIGH level signal. Indicates printer out of paper. Printer enters WAIT state until paper is reloaded and the ON LINE key is pressed.                                         |
| SELECT      | 13         |      | -           | PRT    | Active HIGH level. Indicates that the printer is ready to receive and print data. It is not active when the printer is in WAIT or in FAULT state or upon Software Deselect Command. |
| AUTOFEEDXT  | 14         |      | -           | HOST   | Must be low for at least 50 ms before and after a CR.                                                                                                                               |

| Signal Name    | Pin Number |       |             | Source | Description                                                                                                                                    |
|----------------|------------|-------|-------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Signal     | Wire  | Return Wire |        |                                                                                                                                                |
| -              | 15,34      | -     | -           |        | Not used.                                                                                                                                      |
| GND            | -          | 16,33 | -           | -      | Common Signal Ground.                                                                                                                          |
| CHASSIS GROUND | -          | 17    | -           | -      | Frame ground.                                                                                                                                  |
| +5VDCO PT      | 18         | -     | -           | PRT    | D.C. voltage supplies (100-mA max.250 mA later on for LAN adapters). It is not installed as default and it is installable only by Technician.  |
| INIT           | 31         | -     | -           | HOST   | Active LOW level. Causes the printer to initialize. BUSY signal is forced high.                                                                |
| ERROR          | 32         | -     | -           | PRT    | Active LOW level. Indicates that the printer is disabled (WAIT state) because of a paper-out condition or a printer malfunction (FAULT state). |
| +5V            | 35         | -     | -           | PRT    | Pulled up signal. (33 k ohm).                                                                                                                  |
| SELECTIN       | 36         | -     | -           | HOST   | Active LOW level. It enables the printer. A jumper can connect it to ground.                                                                   |

# The Serial Interface

This printer provides both RS-232/C and RS-422/A electrical serial interfaces.

The interface mode is selected via menu, see in the *System Menu*, under INTERFACE, the I/F:TYPE function (I/F:TYPE:BOTH, I/F:TYPE:PARALL and I/F:TYPE:SERIAL values), please refer to the *User's Manual* on the CD-Rom.

- *Transmission Type*

Data is sent and received in start/stop (asynchronous) transmission

- *Character Format*

Each character is transmitted in the following format:

1 START BIT + 8 DATA BITS + 1 PARITY BIT + 1 STOP BIT

The least significant bit of the data bits is sent first after the start bit. The number of data bits is selected via menu, see in the *System Menu*, under SERIAL OPTIONS, the SER:DATA BITS function, please refer to the *User's Manual* on the CD-Rom.

The parity bit, when present, follows the data bits. The start bit is a logical "0" and the stop bit is a logical "1". The start and stop bits are used as character framing bits

- *Printer Connector*

ANSLEY 609-25S or equivalent connector with 25 female contacts and male shell in accordance with ISO-IS2110 mechanical characteristics

- *Drive Capability*

Min. 50 feet (15 m) for all supported data rates

- *Cable Connector*

AMP 205208/1 or equivalent connector with 25 male contacts and female shell in accordance with ISO-IS2110 mechanical characteristics

- *Interface Signals*

The table on the following page lists the RS-232/C interface signals (full-duplex interface):

| Signal Name | Pin Name | Local Cnt Source | Remote Cnt Source | ISO/ CCITT circuit | RS232/C circuit | Description                                                                                                                                                                    |
|-------------|----------|------------------|-------------------|--------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FRAME GND   | 1        | -                | -                 | 101                | AA              | This printer is shipped with pin 1 connected to the frame ground (protective ground).                                                                                          |
| SIGNAL GND  | 7        | -                | -                 | 102                | AB              | This pin is the common 0V of the power supply.                                                                                                                                 |
| TXD         | 2        | PRT              | PRT               | 103                | BA              | Transmitted Data Signal (an output from printer). A MARK condition is held during the IDLE communication state. An indeterminate state is present when printer is powered off. |
| RXD         | 3        | HOST             | DATA SET          | 104                | BB              | Received data signal (an input to printer).                                                                                                                                    |
| RTS         | 4        | PRT              | PRT               | 105                | CA              | Request to Send Signal (an output from printer). Active HIGH level signal. until printer is powered off, then an indeterminate state is present.                               |
| CTS         | 5        | -                | DATA SET          | 106                | CB              | Clear to Send (an input to printer). Active HIGH level signal. Indicates that the host or data set is ready to receive data.                                                   |
| DSR         | 6        | -                | DATA SET          | 107                | CC              | Data Set Ready. Active HIGH level signal. Indicates that the host or data set is ready to be connected to the printer and for data transfer.                                   |
| DCD         | 8        | -                | DATA SET          | 109                | CF              | Data Carrier Detector. Active HIGH level signal. Indicates that the host is transmitting or the data set is receiving the Data Carrier signal.                                 |
| 2nd RTS     | 11       | PRT              | -                 | 120                | SCA             | Functionally equivalent to the DTR signal.                                                                                                                                     |
| DTR         | 20       | PRT              | PRT               | 108                | CD              | Data Terminal Ready. Normally HIGH (ON). Indicates printer is ready to initiate a connection.                                                                                  |

This table lists the RS-422/A interface signal (full-duplex interface):

| ISO Circuit ID. | Signal Source | Description                                                                                  | Pin Number |
|-----------------|---------------|----------------------------------------------------------------------------------------------|------------|
| T (A)           | PRINTER       | Transmit. Mark signal is present when printer is not sending data.                           | 13         |
| T (B)           |               | Transmit Return.                                                                             | 14         |
|                 |               |                                                                                              |            |
| R (A)           | HOST          | Receive. A Mark level is expected when sender is in idle state.                              | 16         |
| R (B)           |               | Receive return                                                                               | 19         |
| G               |               | Signal Ground. Always connected to the 0 Volt of the power supply.                           | 7          |
| SHIELD          |               | Cable Shield. Optionally connected to the frame ground of the printer via a suitable jumper. | 1          |